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Monticello Mill Tailings Site

Environmental Report for Calendar Year 1994

May 1995

U.S. Department of Energy
Grand Junction Projects Office
P.O. Box 2567
Grand Junction, CO 81502–2567

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Prepared for
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Abbreviations and Acronyms

CAS	Chemical Abstracts Service
CDT	conductivity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	U.S. Code of Federal Regulations
COE	U.S. Army Corps of Engineers
DCG	derived concentration guideline
DOE	U.S. Department of Energy
EDE	effective dose equivalent
Eh	oxidation-reduction potential
EML	Environmental Measurements Laboratory
EMSL	Environmental Measurement Systems Laboratory
EPA	U.S. Environmental Protection Agency
g/F	grams per filter
GJPO	Grand Junction Projects Office
HQ	Headquarters
MED	Manhattan Engineer District
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MMTS	Monticello Mill Tailings Site
mrem	millirems
mrem/yr	millirems per year
μCi/mL	microcuries per milliliter
μg/F	micrograms per filter
μg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
μg/mL	micrograms per milliliter
μm	micrometer
μmhos/cm	micromhos per centimeter
mV	millivolts
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/F	picocuries per filter
pCi/L	picocuries per liter
pg/mL	picograms per milliliter
PM_{10}	particulate matter less than or equal to 10 micrometers in diameter
ppm	parts per million
QA	quality assurance
QAPP	Quality Assurance Program Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RI/FS—EA	Remedial Investigation/Feasibility Study—Environmental Assessment

Abbreviations and Acronyms (continued)

TCL	Target Compound List
TDS	total dissolved solids
TLD	thermoluminescent dosimeter
TSCA	Toxic Substances Control Act
UMTRCA	Uranium Mill Tailings Radiation Control Act
UPDES	Utah Pollution Discharge Elimination System
VCA	Vanadium Corporation of America

Executive Summary

This report contains information pertaining to environmental activities conducted during calendar year 1994 at the Monticello Mill Tailings Site (MMTS) in Monticello, Utah. Rust Geotech, the prime contractor for the U.S. Department of Energy (DOE) Grand Junction Projects Office facility in Grand Junction, Colorado, prepared this report in accordance with the requirements of DOE Order 5400.1, *General Environmental Protection Program*, and supplemental information received from DOE Headquarters.

Environmental activities conducted at the MMTS during 1994 were associated with remedial action, the analysis of tailings disposal sites, a baseline risk assessment, and radiological and nonradiological monitoring.

Remedial action activities conducted in 1994 included construction of a storm-water retention pond and runoff diversion ditch along the north boundary of the Monticello Millsite. In addition, remedial action was completed on four Monticello peripheral properties.

An analysis of potential disposal sites for MMTS uranium and vanadium mill tailings was conducted in 1994. Five alternatives were analyzed: (1) placement of tailings in a repository on the Far South Site (West) (this action was the proposed action selected in the MMTS Record of Decision), (2) stabilization of tailings on the millsite, (3) placement of tailings in a repository on the Near South Site, (4) placement of tailings in a repository on the Far South Site (East), and (5) transport of tailings to the White Mesa Mill disposal facility near Blanding, Utah. In December 1994, DOE decided to continue with the original action proposed in the MMTS Record of Decision.

A baseline risk assessment was initiated in 1994 as part of the on-going remedial investigation/feasibility study for Operable Unit III (includes groundwater and surface water on the millsite and downstream peripheral properties). The risk assessment will evaluate human health and ecological risks posed by contaminated sediments, groundwater, and surface water within Operable Unit III.

Radiological and nonradiological monitoring programs at the MMTS included monitoring of atmospheric radon, particulate matter, direct gamma radiation, surface water, and groundwater. Atmospheric radon concentration was measured at 13 locations off the millsite and two locations on the millsite boundary. Results of the year's monitoring indicated that radon concentrations exceeded the U.S. Environmental Protection Agency (EPA) standard for atmospheric radon at one off-site and both site-boundary locations. These results are consistent with analytical results from previous years.

Air particulate monitoring for radiological and nonradiological constituents was conducted with seven low-volume and five high-volume particulate samplers. Two of the

samplers were located at background locations, and 10 of the samplers were located adjacent to the millsite. The maximum airborne concentrations of radium-226, thorium-230, and total uranium in samples from all locations were below the regulatory limits specified by DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. EPA's standards of 50 micrograms per cubic meter ($\mu g/m^3$) (annual average) and 150 $\mu g/m^3$ (24-hour maximum) for acceptable levels of particulate matter smaller than or equal to 10 micrometers were not exceeded in samples from any location.

Gamma radiation was monitored at 8 on-site and 11 off-site locations. Samples from three of the on-site monitoring locations yielded gamma radiation levels above the DOE/EPA total dose standard of 100 millirems per year (mrem/yr) above background, whereas samples from all off-site locations yielded levels below the standard.

Off-site dose modeling for the MMTS was conducted to determine compliance with the DOE/EPA standard of 100 mrem/yr above background. The effective dose equivalent to the maximally exposed individual near the MMTS (about 100 meters north of the site boundary) was calculated at 29.5 mrem/yr above background. Calculation of this dose involved summation of the radon, air particulate, and gamma sources terms.

Surface-water sources upgradient of, on, and downgradient of the millsite were sampled in May and October 1994. Samples from Montezuma Creek, a perennial stream that flows through the millsite property, and on-site ponds and seeps typically have contained contaminants at levels exceeding state of Utah surface-water standards. Some of this contamination is the result of discharge from the alluvial aquifer beneath the millsite. During 1994, levels of pH, total dissolved solids, gross alpha, and gross beta exceeded their respective state standards in one or more samples collected from Montezuma Creek. In the on-site ponds and seeps, levels of arsenic, iron, nitrate, pH, selenium, total dissolved solids, gross alpha, gross beta, and radium-226+228 exceeded state standards in one or more samples.

Groundwater monitoring was conducted within three stratigraphic zones on and near the millsite: the shallow, upper flow system (alluvial aquifer); the deeper, Burro Canyon aquifer; and the Dakota Sandstone, which acts as an aquitard between the two aquifers. The shallow alluvial aquifer is contaminated by leached products of uranium and vanadium mill tailings. During 1994, Uranium Mill Tailings Radiation Control Act and state of Utah groundwater standards for arsenic, fluoride, molybdenum, nitrate, pH, selenium, gross alpha, radium-226+228, and uranium-234+238 were exceeded in samples from one or more alluvial wells. The standards for radium-226+228 were exceeded in samples collected from one downgradient and one crossgradient Burro Canyon well, but these results were anomalous when compared with historical results from these wells. All other samples from Burro Canyon wells contained analyte concentrations below standards. The Burro Canyon aquifer is used as a domestic water supply source in the Monticello area. Samples from wells in the Dakota Sandstone contained levels of molybdenum and gross alpha that exceeded standards. Because of the limited amount of

Dakota Sandstone well data available, a determination cannot yet be made if these excessive concentrations are natural background values, statistical outliers, or a result of tailings contamination.

1.0 Introduction

The Monticello Mill Tailings Site (MMTS), located in San Juan County, Utah, comprises several tracts of land, including the Monticello millsite, the Bureau of Land Management compound, the South Site (Figures 1 and 2), and 25 peripheral properties surrounding the millsite. The U.S. Department of Energy (DOE) owns the former three tracts and several of the peripheral properties. Other entities or individuals own the remaining peripheral properties. The millsite is a 31.6-hectare (78-acre) tract of land located within the city limits of Monticello (1990 population of 1,838) and consists of the mill area, which comprises approximately 4 hectares (10 acres), and the tailings impoundment area, which comprises about 28 hectares (68 acres). Except for a maintenance shed, none of the original mill buildings remain on site. Residential dwellings are located on peripheral properties adjacent to the north, south, and east boundaries of the millsite.

The millsite is located in the valley of Montezuma Creek, a perennial stream that flows from west to east through the center of the millsite. Underlying the site are two primary aquifers: (1) an upper flow system (referred to as the alluvial aquifer) composed of unconsolidated materials deposited by Montezuma Creek, fill material, weathered bedrock, and hillslope colluvium, and (2) a confined-to-semiconfined sandstone aquifer in the Burro Canyon Formation. The alluvial aquifer is approximately 5 to 7 meters (15 to 20 feet) thick near Montezuma Creek but thins gradually toward the valley sides. The Burro Canyon aquifer is at a depth of approximately 15 meters (50 feet) and is approximately 36 meters (120 feet) thick. This sandstone aquifer supplies domestic water and is capable of yielding as much as 200 gallons per minute. Variably saturated low-permeability units constituting the Mancos Shale and Dakota Sandstone separate the alluvial aquifer from the Burro Canyon aquifer.

Uranium and vanadium mill tailings and other byproduct materials produced during early mill operations contaminate the millsite and peripheral properties. The tailings impoundment area contains an estimated 1,426,000 cubic meters (1,865,000 cubic yards) of tailings and contaminated soil in four discrete piles (Figure 2). An additional 401,000 cubic meters (525,000 cubic yards) of contaminated material is present on or has been removed from peripheral properties (DOE 1993). All tailings and contaminated materials removed under remedial action will be permanently stored in a repository on the South Site.

The Vanadium Corporation of America (VCA) constructed the mill in 1942 with funds from the Defense Plant Corporation. Initially, VCA processed only vanadium, but from 1943 to 1944, the VCA processed a uranium-vanadium sludge for the Manhattan Engineer District (MED). VCA milling operations ceased in 1944 but were renewed from 1945 to 1946 to continue the production of uranium-vanadium sludge for MED. The U.S. Atomic Energy Commission purchased the millsite in 1948. Uranium milling

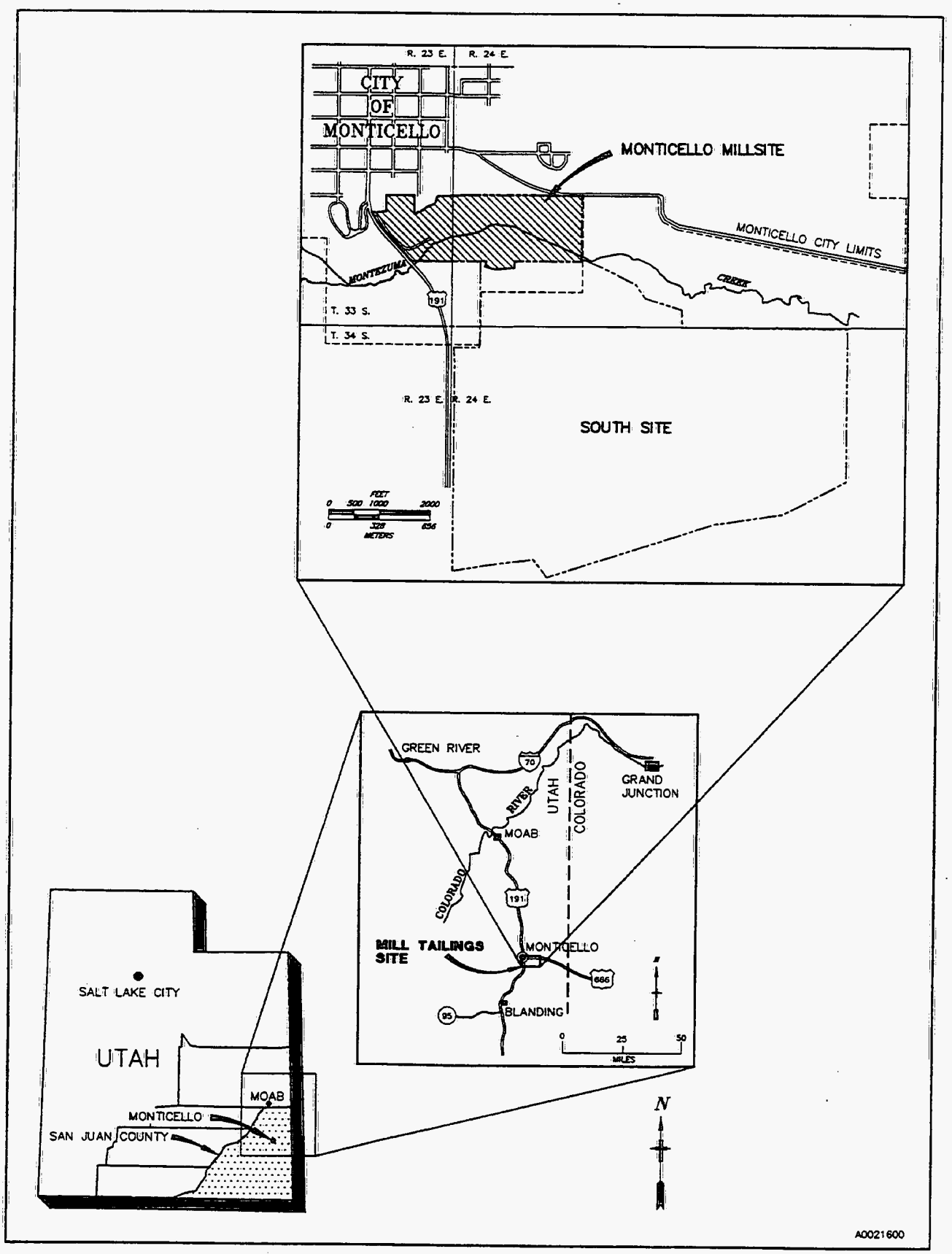

Figure 1. Location of Monticello Mill Tailings Site

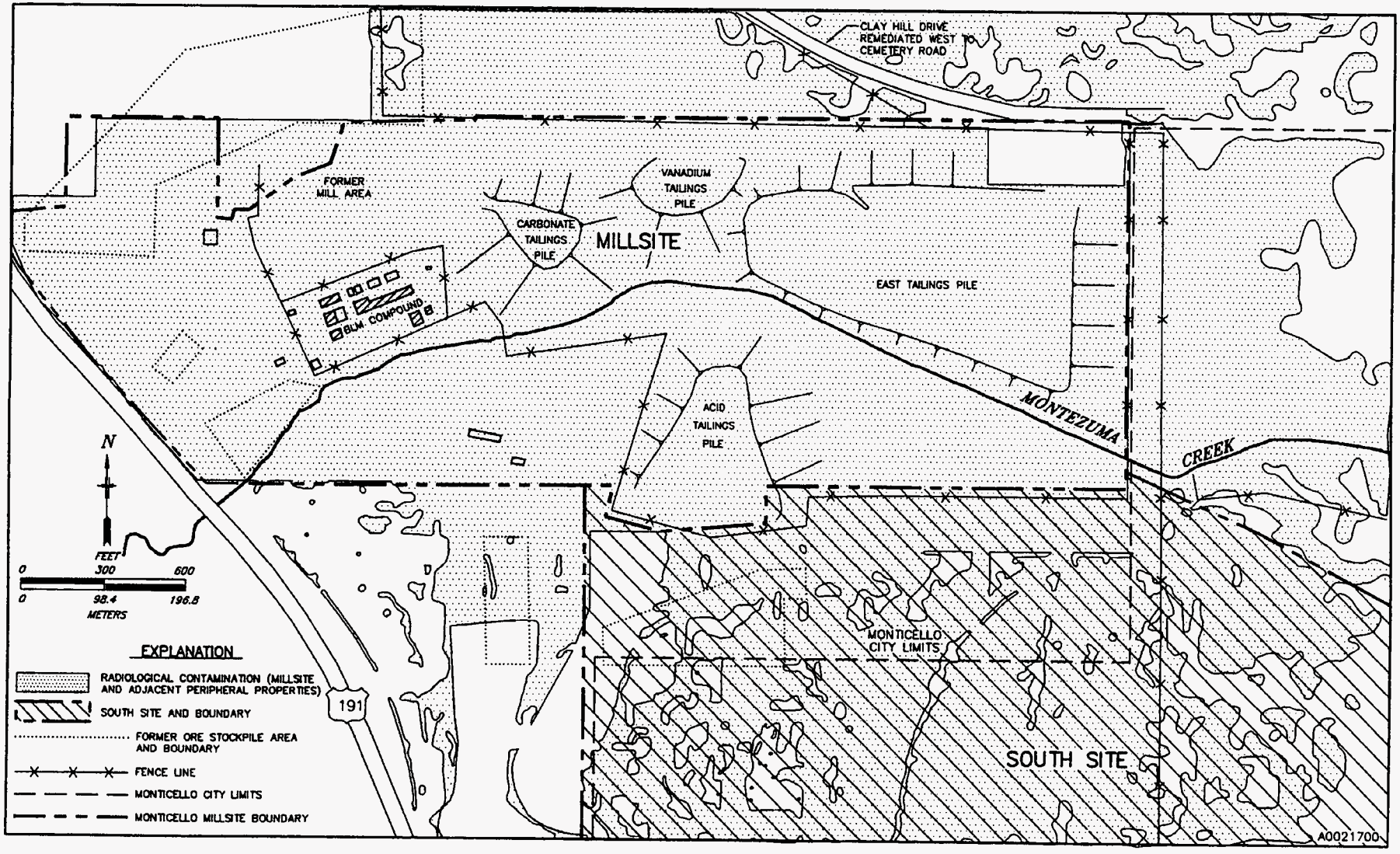

Figure 2. Radiological Contamination Map of Monticello Millsite

began in September 1949 and continued until January 1960 when the mill was permanently closed. At that time, part of the land was transferred to the Bureau of Land Management. This land was returned to DOE in 1990, and DOE now owns and manages this returned parcel along with the remainder of the millsite.

During VCA operations, the environmental problems receiving attention at the millsite arose from the salt roast process used to enhance vanadium recovery. Along with chlorine and hydrogen chloride gas, an average of nearly 1,182 kilograms (2,600 pounds) of dust containing 0.363-percent uranium oxide and 1.52-percent vanadium pentoxide escaped daily through the roaster stack (Allen and Klemenic 1954). In response to complaints from local residents, VCA verified corrosion of wire fences, clotheslines, and galvanized roofs. The salt roast process was discontinued in 1955.

Liquid effluent from the salt roast/carbonate leach plant (which contained substantial concentrations of chloride, sulfate, carbonate, bicarbonate, sodium, and other dissolved species) was released into Montezuma Creek. Radium-226 from water and wind erosion of the tailings piles also was released into the creek (Whitman and Beverly 1958). Soluble radium activity in Montezuma Creek was measured as high as 160 picocuries per liter (pCi/L). During milling operations, the tailings were usually moist, and erosion by wind was minimal. Within a year after shutdown, however, the tailings dams and surfaces of the tailings piles dried out, and tailings sand began to migrate as dunes.

Several cleanup activities conducted by the U.S. Atomic Energy Commission after mill closure substantially stabilized the area but did not eliminate surface-water and groundwater contamination. Extensive studies (Lennemann 1956, George 1958, George 1959, Whitman and Beverly 1958, DOE 1990a) conducted at the millsite demonstrated that all four tailings piles contribute to contamination of the alluvial aquifer and surface water, both on and off site. Currently, the contaminated water in the alluvial aquifer is not used for any purpose, whereas the water in Montezuma Creek is used for livestock watering, wildlife habitat, and irrigation downstream of the millsite.

The MMTS was accepted into the Surplus Facilities Management Program in 1980. Under this program, the chief objective was to minimize potential health hazards to the public and environment that were associated with the tailings at the millsite. To provide a basis for making decisions regarding the remediation of the site, an environmental and engineering characterization was completed and documented in the *Monticello Remedial Action Project Site Analysis Report* (Abramiuk et al. 1984). In November 1989, the MMTS was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List. The *Final Remedial Investigation/ Feasibility Study—Environmental Assessment for the Monticello, Utah, Uranium Mill Tailings Site* (RI/FS—EA) (DOE 1990a) was completed in March 1990; the *Monticello Mill Tailings Site—Declaration for the Record of Decision and Record of Decision Summary* (DOE 1990b) was approved by the U.S. Environmental Protection Agency (EPA), the state of Utah, and DOE in September 1990.

The Record of Decision describes selected remedial actions for two of the three operable units (OUs) constituting the MMTS and summarizes the extent of contamination, as previously understood, in the third OU. For OU I, it addresses the excavation of mill tailings and other hazardous substances from the millsite and their containment in a permanent repository. Excavation of hazardous substances from properties peripheral to the millsite is addressed for OU II. Collectively, the remedial actions for OU I and OU II are referred to as the Monticello Remedial Action Project. Remedial action for OU III, which addresses groundwater and surface water on the millsite and downstream peripheral properties, will be selected in a separate Record of Decision after completion of an RI/FS.

Responsibility for the administration, maintenance, and environmental monitoring of the inactive millsite and tailings area resides with the DOE Grand Junction Projects Office (GJPO). Rust Geotech (Rust), the prime contractor for DOE-GJPO, performs the environmental monitoring at the millsite.

This Site Environmental Report presents information pertaining to environmental activities conducted during calendar year 1994 at the MMTS. It is organized into the following major sections: Compliance Summary—January 1, 1994, through December 31, 1994; Environmental Program Information; Environmental Radiological Program Information; Environmental Nonradiological Program Information; Groundwater Monitoring and Protection Program; Quality Assurance; Appendix A, Monitoring Data; Appendix B, Time-Concentration Graphs; and Appendix C, Well Location Maps Showing Groundwater Analytes that Exceed Federal/State Standards.

The Compliance Summary section summarizes DOE-GJPO compliance with major federal and state environmental requirements at the MMTS for the period January 1, 1994, through December 31, 1994.

The Environmental Program Information section contains (1) a description of the contamination present at the MMTS; (2) a summary of environmental monitoring performed on and near the MMTS, including a discussion of how monitoring results compare with applicable standards; and (3) a summary of significant environmental activities conducted at the MMTS.

The Environmental Radiological and Environmental Nonradiological Program Information sections summarize the results of the radiological and nonradiological monitoring programs conducted on and near the MMTS.

In the Groundwater Monitoring and Protection Program section, the hydrogeology at the millsite and the program conducted to monitor groundwater are described. Analytical results of groundwater monitoring are compared with federal and state standards, and diagrams showing maximum contaminant concentrations within groundwater are presented.

The Quality Assurance (QA) section summarizes the measures taken to ensure the quality of monitoring data collected on and near the MMTS. This section also includes results of the participation of the GJPO Analytical Chemistry Laboratory in interlaboratory QA programs.

Appendix A comprises analytical data collected during 1994 and is organized according to medium and sample date. Sampled media consist of radon, air particulates, direct gamma radiation, surface water, sediments, and groundwater.

In Appendix B, data from selected media and locations are presented graphically to show changes in analyte concentrations over time. Comparisons between collected data and applicable state or federal standards also are included.

In Appendix C, maps of well locations identify which groundwater analytes exceeded their respective federal/state standards at each well. Results of the two 1994 sampling events are presented.

An Abbreviations and Acronyms section follows the Table of Contents; a References section follows the Quality Assurance section; and a Distribution List of organizations and people who receive copies of this report follows the References section.

2.0 Compliance Summary—January 1, 1994, Through December 31, 1994

2.1 Compliance Status

The compliance status for each of the major environmental statutes and Executive Orders applicable to the MMTS is discussed below.

2.1.1 Comprehensive Environmental Response, Compensation, and Liability Act/ Superfund Amendments and Reauthorization Act

The MMTS was listed on the CERCLA National Priorities List on November 21, 1989. Remediation of the site is in accordance with CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986. Environmental restoration of the MMTS is prescribed in a Federal Facility Agreement, signed in December 1988, among DOE, EPA, and the state of Utah. DOE activities associated with remediation of the MMTS have been conducted in full compliance with the Federal Facility Agreement. Remedial actions are prescribed in the MMTS Record of Decision (DOE 1990b) and include removal of mill tailings and other hazardous substances, site reconstruction, and cleanup of contaminated groundwater and surface water.

Designs for several phases of the Monticello Remedial Action Project were prepared in accordance with the applicable or relevant and appropriate requirements identified in the MMTS Record of Decision. In 1994, design documents submitted to DOE Headquarters (DOE-HQ) and/or EPA and the state of Utah for review consisted of

- Draft Design of the Lined Repository
- Remedial Action Design Packages for Peripheral Properties
  MP-00179-VL, Phase II and MP-00947
  MP-00179-VL, Phase III
  MP-00181-OT, Phase III (underground storage tank removals)
  MP-00391-VL, Phase I
  MP-07019-VL (Halls Ditch)

MMTS activities that occurred in 1994 included construction of a storm-water retention pond and runoff diversion ditch for OU I and completion of remedial action on four properties for OU II.

The *Draft Final Monticello Site Management Plan* (DOE 1994b) was submitted to EPA and the state of Utah for review in December 1994. This document establishes the overall plan for remedial action activities at the MMTS and establishes milestones against which progress will be measured.

In April 1993, DOE determined that the Record of Decision-selected alternative of transporting tailings from the MMTS to a permanent on-site repository (Far South Site [West]) south of the millsite needed to be reevaluated. A decision was made to further investigate four other alternatives: (1) stabilization of tailings on the millsite, (2) placement of tailings in a repository on the Near South Site, (3) placement of tailings in a repository on the Far South Site (East), and (4) transport of tailings to the White Mesa Mill disposal facility near Blanding, Utah. These alternatives were evaluated during 1994. On December 22, 1994, DOE decided to continue with the original action proposed in the MMTS Record of Decision (Far South Site [West]). This decision met the CERCLA requirement for "substantial and continuous physical on-site remedial action."

The *Draft Operable Unit III Remedial Investigation/Feasibility Study-Work Plan* (DOE 1994e), *-Field Sampling Plan* (DOE 1994c), and *-Quality Assurance Project Plan* (DOE 1994d) were submitted to EPA and the state of Utah for review in July 1994. The technical approach presented in the draft documents was significantly revised on the basis of EPA and state comments. A concept paper entitled *Technical Approach for the Operable Unit III Risk Assessments and Groundwater Modeling* (DOE 1994h) was prepared to document the revised technical approach. The concept paper was provided to EPA and the state of Utah on October 31, 1994; concurrence in the revised technical approach was received from EPA and the state in December. A Revised Draft Work Plan, Field Sampling Plan, and Quality Assurance Project Plan were prepared in accordance with the revised technical approach and submitted to EPA and the state for review in March 1995.

The Information Repositories for the MMTS were updated in March, June, September, and December 1994. The repositories are located at the GJPO Technical Library in Grand Junction, Colorado, and at DOE's Monticello Field Office.

2.1.2 Resource Conservation and Recovery Act

The draft document, *Concept Paper: Managing Wastes Encountered on the Monticello Mill Tailings Site and Vicinity Properties* (DOE 1994a), was submitted to EPA and the state of Utah in July 1994. The document addressed

- The exclusion of byproduct material from the definition of hazardous waste.
- The definition of "Area of Contamination" for the MMTS.
- The application of Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions to the MMTS (the restrictions do not apply to remedial activities occurring within a CERCLA Area of Contamination).
- The approach for temporarily storing wastes requiring special management (e.g., nonroutine mill tailings).

Comments on the Concept Paper were received from EPA and the state of Utah in November 1994. The revised document, entitled *Special Waste Management Plan for the Monticello Mill Tailings Site and Vicinity Properties* (DOE 1995), was issued in March 1995.

To date, no RCRA-listed or -characteristic hazardous wastes have been identified or managed at the MMTS. The Utah Hazardous Waste Management Rules will be considered an applicable or relevant and appropriate requirement if hazardous waste must be managed as part of the cleanup activities.

2.1.3 National Environmental Policy Act

The MMTS RI/FS—EA (DOE 1990a) was approved by EPA and the state of Utah in January 1990 and finalized in March 1990; a Finding of No Significant Impact for the remediation was issued in February 1990.

2.1.4 Uranium Mill Tailings Radiation Control Act

The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 authorized remedial action at certain inactive uranium milling sites that were not owned by the federal government. Because the MMTS is owned by DOE, this is not an applicable requirement. However, UMTRCA is considered to be a relevant and appropriate requirement for remedial action at this site. Cleanup of radioactive contamination on lands and buildings is conducted to the standards specified in 40 *U.S. Code of Federal Regulations* (CFR) 192.

2.1.5 Clean Air Act/National Emission Standards for Hazardous Air Pollutants

Air quality at the millsite is monitored to verify conformance with ambient air-quality standards. As determined in the MMTS RI/FS—EA, the Clean Air Act is an applicable requirement for remedial action at the millsite. The millsite is specifically identified under and subject to the provisions of 40 CFR 61, Subpart Q, which defines a radon-flux standard (20 pCi per square meter per second) for DOE facilities. This flux standard is exceeded at the tailings piles on the millsite. One objective of the planned environmental restoration will be to remove the contaminant source (i.e., tailings piles) so that the radon-flux standard is no longer exceeded. The revised compliance position paper for Subpart Q requirements addressing the Memorandum of Understanding negotiated between DOE-GJPO and EPA was submitted to EPA and the state of Utah in December 1991; no further action was necessary.

Fugitive dust control requirements, as established by Section R307-1-4.5 of the Utah Air Conservation Regulations, are applicable to the MMTS. Actions taken toward compliance with state requirements included the application of water spray to

construction areas and haul roads; the application of surfactants to temporary tailings piles; the cessation of construction operations when wind speeds exceeded 40 miles per hour; and the limitation of vehicle speeds. Although not required by the state regulations, opacity measurements were taken by a certified opacity observer to ensure that dust emissions did not exceed permissible levels.

2.1.6 Clean Water Act/National Pollutant Discharge Elimination System

As determined in the MMTS RI/FS—EA, the Clean Water Act is an applicable requirement for remedial action. Waters affected by the millsite are routinely monitored, and collected data are compared to state of Utah water quality standards. Both surface water and groundwater at the millsite are contaminated by leachate from mill tailings and contain concentrations of radiological and inorganic contaminants that exceed applicable standards (see discussion in Section 3.2.5, Surface Water). One objective of the planned environmental restoration will be to remove the source of contamination, which will improve water quality on the site. The remedial action for surface water and groundwater will be selected through the RI/FS being conducted for OU III.

In 1993, DOE submitted a Utah Pollution Discharge Elimination System (UPDES) permit application to the Utah Division of Water Quality, Department of Environmental Quality, for installation of a wastewater treatment plant. The treatment plant, which will be installed in 1995 east of the millsite, will treat water in Pond No. 3 before discharging it into Montezuma Creek. Specific effluent limitations for the discharge water were proposed by the state of Utah in 1993 and clarified in February 1994. Routine sampling of the discharge water will be conducted once the treatment plant begins operations.

Discharges of storm-water runoff on the MMTS are regulated by the UPDES program. Because remedial activities at the millsite and several peripheral properties will result in land disturbances that exceed 2 hectares (5 acres), storm-water pollution prevention and erosion control measures were incorporated into the remedial design of each property. The specific measures incorporated were derived from the *Authorization to Discharge Under the UPDES General Permit for Storm-Water Discharges from Construction Activities That Are Classified as "Associated with Industrial Activity"* (State of Utah 1992). Storm-water and erosional controls will be routinely inspected and maintained to ensure their integrity and performance.

2.1.7 Safe Drinking Water Act

The provisions of the Safe Drinking Water Act are potentially applicable or relevant and appropriate to the MMTS because the Burro Canyon Formation, which is located beneath the millsite, is used as a public water supply. Should contamination associated with millsite activities be identified in the Burro Canyon aquifer, maximum contaminant levels identified in the Safe Drinking Water Act may be used to establish cleanup

standards. Maximum contaminant levels also may be used to establish cleanup standards in the shallow alluvial groundwater system that underlies the tailings piles and occurs downgradient of the millsite.

2.1.8 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) regulates the manufacture of chemicals and the control of substances such as asbestos and polychlorinated biphenyls (PCBs). Asbestos was identified at the MMTS in 1994 in several of the buildings and in soil beneath the buildings. In June 1994, an asbestos inspection was performed in accordance with TSCA and state (Utah Administrative Code, R446-1-8, Utah Air Conservation Rules) regulations. The *MMTS Asbestos Inspection Report* (DOE 1994g) was completed in August and submitted to EPA and the state of Utah. No TSCA-regulated PCBs have been identified on the MMTS.

2.1.9 Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act governs the use, storage, registration, and disposal of pesticides. Because pesticides were not used on the MMTS in 1994, this Act did not apply to MMTS activities in 1994.

2.1.10 Endangered Species Act

The Endangered Species Act requires DOE to ensure that any actions authorized, funded, or carried out at the MMTS do not "jeopardize the continued existence of threatened or endangered species and do not destroy or adversely modify critical habitat required for the continued existence of that species." A list of threatened or endangered species that could occur at or in the vicinity of the MMTS has been compiled; to date, none of the species has been observed at the site. All areas that will be disturbed during remedial action will be surveyed before disturbance to ensure DOE compliance with this applicable requirement.

2.1.11 National Historic Preservation Act/Archaeological Resources Protection Act

The National Historic Preservation Act and the Archaeological Resources Protection Act provide for the preservation and protection of historical and archaeological resources that may be affected by a federal construction project or federally licensed activity or program. Activities associated with the MMTS have been and will be conducted in accordance with these applicable requirements. An archaeological survey of 55 acres was conducted within the 200-foot-wide corridor of a proposed highway-widening project associated with the White Mesa Mill Alternative. No prehistoric or historic sites were identified; findings were reported to the Utah Historic Preservation Office.

2.1.12 Executive Order 11988, "Floodplain Management"

Because the U.S. Army Corps of Engineers (COE) determined in 1990 that the MMTS is located within the floodplain of Montezuma Creek, Executive Order 11988, "Floodplain Management," is an applicable requirement for remedial action. DOE evaluated each remedial design prepared in 1994 to ensure that adverse impacts associated with direct and indirect development of the floodplain were avoided where feasible. In areas where disturbance could not be avoided, plans for restoring the floodplain after remediation were prepared.

2.1.13 Executive Order 11990, "Protection of Wetlands"

In 1989, the COE determined that wetland areas exist on the MMTS along Montezuma Creek from U.S. Highway 191 to the confluence with Vega Creek. To notify EPA of the wetland disturbance planned for OU I, DOE submitted the design drawings of Phase I (construction of millsite infrastructure) to EPA in March 1992. Design drawings for future MMTS work, including restoration of wetland areas, will be submitted to EPA as the designs are completed. At that time, EPA will determine if submission of the designs to COE is necessary. No actions specific to Executive Order 11990 occurred at the MMTS during 1994.

2.1.14 State of Utah Groundwater Quality Protection Regulations

Utah Groundwater Protection Regulations are applicable to the South Site tailings repository and may be applicable to OU III, depending upon the outcome of the baseline risk assessment. DOE will ensure that measures are taken to protect groundwater on the South Site. Results of the OU III risk assessment are anticipated to be available in 1997.

2.1.15 Title 73, "Water and Irrigation," Utah Code Annotated

This provision of Utah law controls the consumption of water within the state. During 1994, construction dewatering was conducted and storm runoff was diverted on the millsite in accordance with these regulations.

2.2 Current Issues and Actions

One milestone was established for environmental restoration activities at the MMTS in 1994. This milestone was met on schedule with the completion of remedial action design packages for four peripheral properties.

Suspected CERCLA hazardous substances were tentatively identified on several MMTS peripheral properties. Characterization of the suspected substances was completed on property MP-00181-OT, Phase I, in 1994; a Site Characterization Report is being prepared for this property. In addition, sampling and analysis plans are being prepared for properties MP-00181-OT, Phase IV; MP-00211-OT; and MP-00990-OT. Further characterization for suspect hazardous substances was deemed unnecessary after reconnaissance visits were completed on properties MP-00105-VL, Phase II; MP-00391-VL, Phase II; and MP-00887-VL.

2.3 Summary of Facility Permits

As specified at 40 CFR 300.400(e), federal, state, or local permits are not required for on-site response actions conducted pursuant to CERCLA. Although this language reduces the administrative burdens associated with permits, the substantive requirements of all applicable or relevant and appropriate requirements must be met. Permit applications for groundwater monitoring well installations, discharges of processed waste water (UPDES), stream channel alterations, and wetland disturbances have been submitted as tools for formalizing communications with the state of Utah and appropriate federal agencies.

3.0 Environmental Program Information

3.1 Sources of Contamination

Uranium and vanadium mill tailings are the principal types of waste at the MMTS; residual uranium ore in old stockpile areas at the millsite is an additional, although minor, type of waste. According to Albrethsen and McGinley (1982), 819,291 metric tons (903,298 short tons) of uranium ore was processed at the Monticello mill between 1948 and 1960, which yielded approximately 2,077 metric tons (2,290 short tons) of uranium oxide and 1,061 metric tons (1,170 short tons) of vanadium pentoxide. Most of the original constituents of the ore, as well as the chemicals added during the milling process, reside in the tailings. Historically, environmental concern focused on the radiological hazards associated with the tailings and ore, but later, it was recognized that a number of trace elements also occurred at elevated concentrations in the ore (Dreesen et al. 1982). These trace elements were not recovered during milling operations but were passed through the processing circuit to the tailings piles.

The tailings generated by the milling operations are contained in four piles referred to as the Carbonate, Vanadium, Acid, and East tailings piles (Figure 2). The Carbonate and Vanadium tailings piles were formed from 1949 to 1955 when the mill was recovering vanadium and some uranium. The process used for the recovery was a salt roast/carbonate leach process. Construction of the Acid tailings pile commenced about 1955. This pile received tailings from the acid leach resin-in-pulp process and a carbonate leach circuit. The East tailings pile was constructed from 1956 until mill shutdown in 1960 and received tailings from the acid leach circuit and the high-temperature, carbonate leach resin-in-pulp circuit. Windblown tailings from these piles contaminated the peripheral properties that are part of the MMTS.

After closure of the mill, the piles were regraded and stabilized with a pit-run gravel, topsoil, and vegetative cover. Materials from all four tailings piles provide a contaminant source for groundwater leachate and atmospheric releases. A critical pathways analysis, in which source terms and pathways of radiation exposure were determined, was performed and documented in the RI/FS—EA (DOE 1990a).

3.2 Environmental Monitoring Summary

3.2.1 Atmospheric Radon

The atmospheric radon monitoring program was initiated at the MMTS in 1984 with the installation of radon detectors at 19 sample locations. After a 12-month collection of baseline data, the sampling network was reduced to eight representative locations. In response to increased remediation activities, seven locations were added during the third

quarter of 1993. Radon concentration was measured at these two on-site and 13 off-site locations (Figure 3) with Landauer Radtrak alpha-sensitive detectors. The detectors were exposed in duplicate 1 meter above the ground surface and were analyzed quarterly (3-month exposure).

The EPA standard (40 CFR 192) for atmospheric radon concentration (at the edge of an inactive uranium mill tailings pile) of 0.50 pCi/L (annual average) above background has been adopted for the MMTS. By using a natural background concentration of 0.4 pCi/L (DOE 1990a), the site-specific standard of 0.9 pCi/L was calculated. As shown in Table 1, the atmospheric radon concentrations measured during 1994 exceeded the EPA standard at both locations along the millsite boundary and at one location (RN-M-04) off the millsite. Concentrations at the remaining off-site locations were below the standard. These values are consistent with previous years' analytical results. Quarterly data collected at each location are listed in Appendix A, Tables A-1 through A-4.

Table 1. Comparison of Average Annual Radon Concentrations At and Near MMTS with EPA Standard during 1994

Sampling Location	Radon Concentration	
	Annual Average (pCi/L)[a]	EPA Standard (including background) (pCi/L)
On Site		
RN-M-06	1.2	0.9
RN-M-07	1.7	0.9
Off Site		
RN-M-04	1.2	0.9
RN-M-10	0.4	0.9
RN-M-11	0.3	0.9
RN-M-13	0.4	0.9
RN-M-14	0.3	0.9
RN-M-15	0.4	0.9
R-M-1-RN	0.7	0.9
R-M-2-RN	0.5	0.9
R-M-3-RN	0.7	0.9
R-M-4-RN	0.5	0.9
R-M-5-RN	0.4	0.9
R-M-6-RN	0.5	0.9
R-M-7-RN	0.6	0.9

[a] 1 pCi/L = 3.7×10^{-2} becquerels per liter.

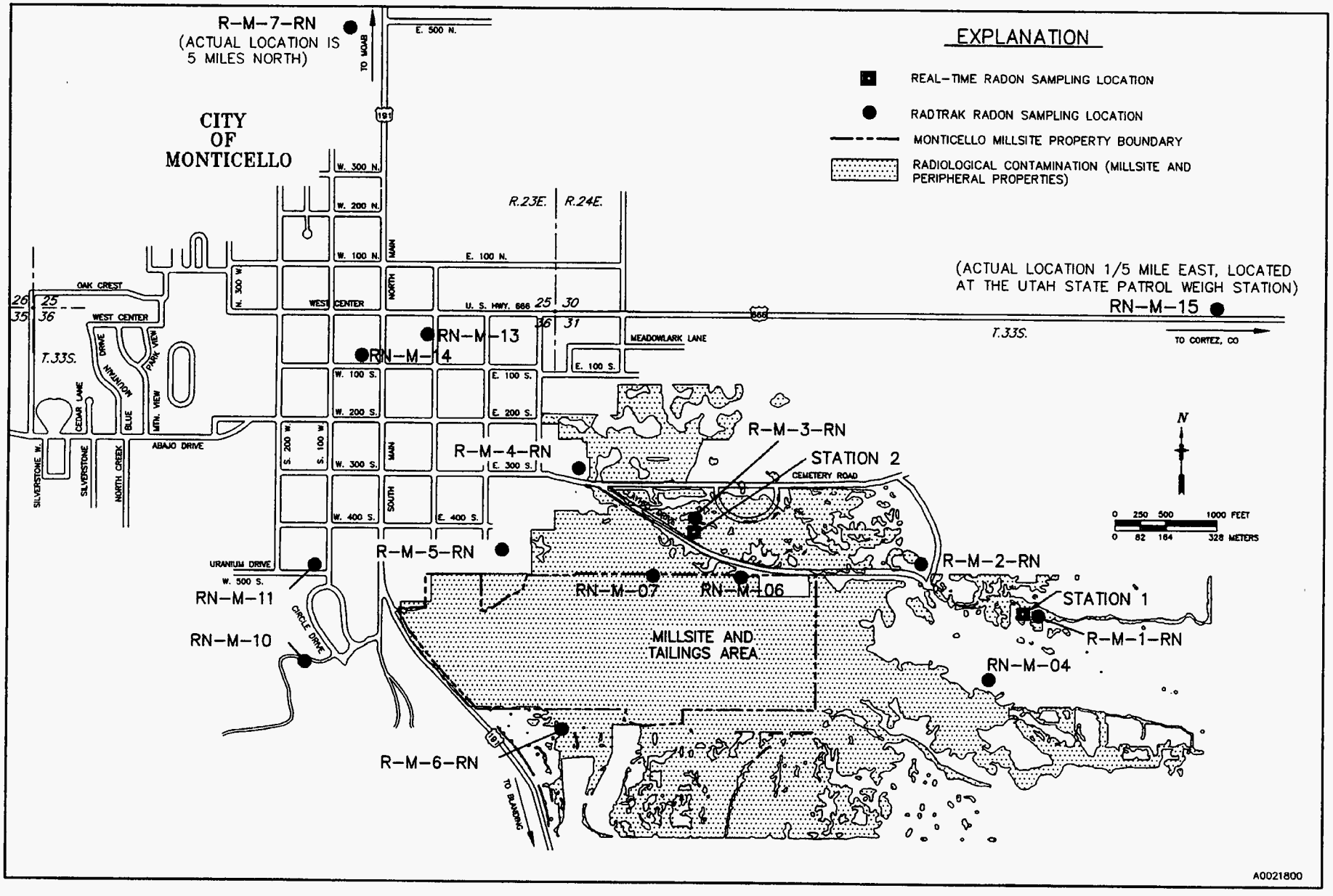

Figure 3. Atmospheric Radon Monitoring Locations At and Near MMTS

Two Pylon AB-5 real-time radon monitors were installed adjacent to the millsite (Stations 1 and 2 in Figure 3) in August 1992 to monitor the effect of increased construction activity on ambient radon concentrations. The monitors were placed at downwind residential locations where the highest concentrations of radon were expected. By monitoring the radon levels, construction activities could be altered if radon concentrations reached unacceptable levels. Results of the monitoring indicated that construction activities did not cause unacceptably high levels of radon concentrations.

3.2.2 Air Particulates

Air particulate monitoring at the MMTS was initiated in August 1983. The original air sampling network consisted of three high-volume air samplers that sampled ambient air at approximately 0.9 cubic meter per minute (m^3/min) for 24 hours every sixth day. Samples were collected on a glass-fiber filter and analyzed for total suspended particulate matter, radium-226, thorium-230, and total uranium. In March 1987, 10-micrometer (μm) size-selective inlets were installed in the intake of the samplers to separate particulate matter 10 μm or smaller (PM_{10}) from larger particles. This action was driven by a change in the national ambient air quality regulations from a total suspended particulate standard to a PM_{10} standard.

In November 1993, seven low-volume (flow rate of 0.06 m^3/min) radioparticulate samplers were installed adjacent to the millsite and the city of Monticello in response to an increase in remedial activities (see Figure 4 for locations). Filters from these samplers were analyzed for radium-226, thorium-230, and total uranium. The existing high-volume samplers were then used for sampling nonradiological PM_{10} only. The low-volume samplers were operated 24 hours a day, 7 days a week. Samples were retained on a glass-fiber filter in each sampler and collected weekly. To obtain average monthly values of radioparticulate concentrations, four weekly filter samples were composited and analyzed as one sample.

In January 1994, two high-volume PM_{10} samplers were added to the monitoring network, and the existing PM_{10} samplers were relocated to more effectively monitor off-site dust emissions (see Figure 4). One of the new high-volume samplers (AIR-M-7) was installed 8 kilometers (5 miles) north of the MMTS to collect background PM_{10} data.

Table 2 compares measured PM_{10} concentrations to EPA standards. Acceptable levels of PM_{10} are defined in the National Ambient Air Quality Standards (40 CFR 50), which specify a maximum annual average of 50 micrograms per cubic meter ($\mu g/m^3$) and a 24-hour maximum concentration of 150 $\mu g/m^3$. During 1994, the maximum annual average and 24-hour maximum concentrations of PM_{10} measured at all sampling locations were well below EPA standards.

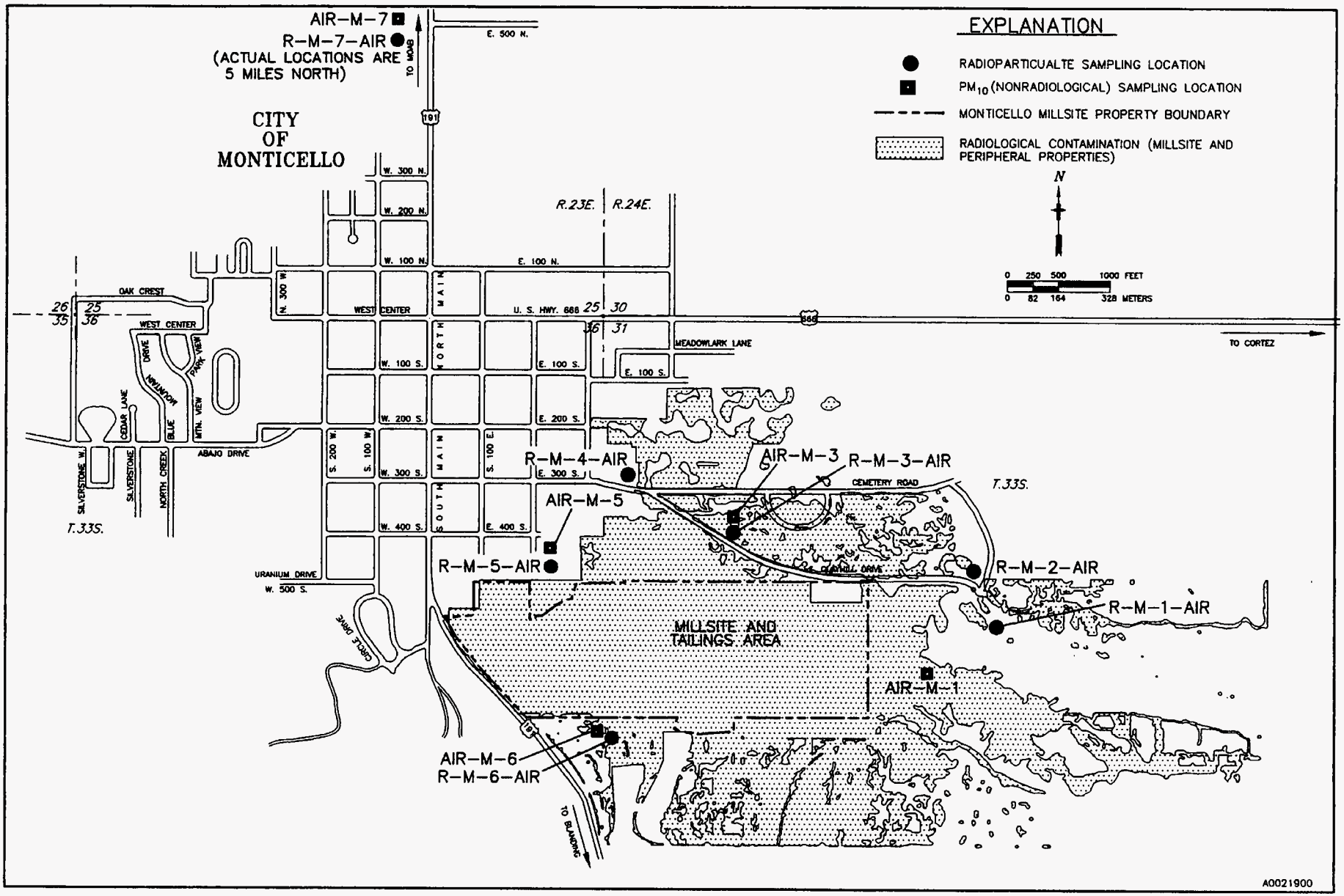

Figure 4. Air Particulate Sampling Locations At and Near MMTS

Table 2. Results of MMTS PM_{10} Monitoring Conducted during 1994

Station	Measured PM_{10}[a] ($\mu g/m^3$)		EPA Standards ($\mu g/m^3$)
AIR-M-1	Maximum	48	150
	Average	9.3	50
	Count	40	
AIR-M-3	Maximum	28.6	150
	Average	10.3	50
	Count	48	
AIR-M-5	Maximum	30.4	150
	Average	11.7	50
	Count	54	
AIR-M-6	Maximum	66.4	150
	Average	11.3	50
	Count	45	
AIR-M-7	Maximum	32.6	150
	Average	7.2	50
	Count	46	

[a]The numbers given in this table are defined as follows:
Maximum - Maximum concentration.
Average - Annual average concentration.
Count - Number of samples collected.

The annual average concentration of PM_{10} measured at the four samplers surrounding the millsite was 10.6 $\mu g/m^3$, and the average 24-hour maximum concentration measured at these samplers was 43.4 $\mu g/m^3$. Background concentrations measured at AIR-M-7 were 7.2 $\mu g/m^3$ (annual average) and 32.6 $\mu g/m^3$ (maximum concentration). The higher PM_{10} concentrations near the millsite were probably caused by fugitive dust from remedial activities on the millsite and from vehicular traffic on unpaved roads and dirty streets in and around Monticello.

Results of PM_{10} analyses for individual stations are listed in Appendix A, Tables A-5 through A-9. Figure B-1 in Appendix B shows measured PM_{10} concentrations as a percentage of the EPA standard at station AIR-M-3. Although not included in this report, graphs for the other stations exhibit trends similar to those apparent in the AIR-M-3 graph.

Table 3 compares 1994 maximum and average radioparticulate concentrations with DOE derived concentration guidelines (DCGs). A DCG represents the concentration that

Table 3. Results of MMTS Radioparticulate Monitoring Conducted during 1994[a]

		Radiological Elements				
		Radium-226 (μCi/mL)[b]	Thorium-230 (μCi/mL)[b]	Thorium-230 (pg/mL)[c]	Uranium (pg/mL)	Uranium (μCi/mL)[b,d]
DCG		1.0E-12	4.0E-14	No DCG	No DCG	2.0E-12
Station						
	Maximum[e]	9.0E-16	6.8E-16	3.5E-08	~4.4E-04	~2.9E-16
R-M-1-AIR	Average	3.9E-16	2.1E-16	1.1E-08	2.8E-04	1.9E-16
	Count	10 (4)	10 (7)	10 (7)	10 (10)	10 (10)
	Maximum	4.7E-16	1.7E-16	8.8E-09	~3.9E-04	~2.6E-16
R-M-2-AIR	Average	2.5E-16	1.6E-16	8.2E-09	2.9E-04	1.9E-16
	Count	11 (4)	11 (6)	11 (6)	11 (11)	11 (11)
	Maximum	2.6E-16	3.1E-16	1.6E-08	~4.7E-04	~3.1E-16
R-M-3-AIR	Average	1.8E-16	1.8E-16	9.3E-09	2.9E-04	1.9E-16
	Count	11 (4)	11 (6)	11 (6)	10 (10)	10 (10)
	Maximum	1.8E-16	1.8E-16	9.3E-09	~4.4E-04	~2.9E-16
R-M-4-AIR	Average	1.3E-16	1.5E-16	7.7E-09	3.1E-04	2.1E-16
	Count	11 (4)	11 (5)	11 (5)	10 (10)	10 (10)
	Maximum	2.3E-16	2.0E-16	1.0E-08	~4.6E-04	~3.1E-16
R-M-5-AIR	Average	1.8E-16	1.7E-16	8.8E-09	3.2E-04	2.1E-16
	Count	11 (4)	11 (6)	11 (6)	10 (10)	10 (10)
	Maximum	1.2E-15	1.3E-15	6.7E-08	2.3E-03	1.5E-15
R-M-6-AIR	Average	5.1E-16	5.5E-16	2.8E-08	7.3E-04	4.9E-16
	Count	11 (5)	11 (6)	11 (6)	10 (10)	10 (10)
	Maximum	1.6E-15	2.0E-16	1.0E-08	~3.3E-04	~2.2E-16
R-M-7-AIR	Average	4.5E-16	1.6E-16	8.2E-09	2.5E-04	1.7E-16
	Count	11 (5)	11 (6)	11 (6)	10 (10)	10 (10)

[a] A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated). Scientific notation E-15 = "x 10^{-15}."

[b] 1 microcurie per milliliter (μCi/mL) = 3.7 x 10^{4} becquerels per milliliter.

[c] pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumes equilibrium and an activity of 0.0194 μCi/μg.

[d] The conversion of uranium concentrations between microcuries and picograms assumes equilibrium and an activity of 0.666 pCi/μg.

[e] The numbers given in this table are defined as follows:

Maximum - Maximum concentration observed in sample period.

Average - Annual average concentration. Samples above detection limit are used in calculation.

Count - Number of samples collected. The number in parentheses indicates the number of samples having concentrations above the detection limit.

would cause a member of the public, residing at the point of collection, to receive a dose of 100 millirems per year (mrem/yr) from a specified radionuclide. Exposures above this limit are considered unacceptable. DCGs for radioparticulates are established in DOE Order 5400.5, *Radiation Protection of the Public and the Environment*. All measured concentrations of radium-226, thorium-230, and total uranium were below DCGs. Results of individual analyses are listed in Appendix A, Table A-10. In Appendix B, Figures B-2 through B-4 show concentrations of radium-226, thorium-230, and total uranium as a percentage of their respective DCGs at station R-M-3-AIR. Graphs for the other radioparticulate sampling stations, although not included in this report, exhibit trends similar to those apparent in the R-M-3-AIR graphs.

3.2.3 Direct Gamma Radiation Monitoring

A direct environmental radiation monitoring program was initiated at the MMTS in April 1991 to assess the potential gamma radiation dose to persons on and near the millsite, in accordance with DOE Order 5400.5 and the DOE guidance document, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* (DOE 1991a). Gamma radiation measurements are included, along with radiation measurements associated with radon and air particulates, in the calculation of total off-site dose to the public to determine compliance with the DOE/EPA standard of 100 mrem/yr above background (see Section 4.3, Off-Site Dose Modeling).

During 1994, radiation measurements were made with $CaSO_4$:Dy (calcium sulfate: dysprosium) thermoluminescent dosimeters (TLDs). Nineteen monitoring locations (Figure 5) on the millsite and surrounding areas were monitored quarterly. Results of the monitoring are presented in Appendix A, Tables A-11 through A-14, and are summarized in Table 4, which compares measured values with the DOE/EPA total dose standard of 100 mrem/yr above background. The background level of gamma radiation dose was calculated at 99 mrem/yr by averaging measurements from stations R-M-7-TLD and TLD-M-13. Three locations on the millsite yielded annual average measurements greater than the standard; annual averages of measurements collected off the millsite were well below the standard. Levels of gamma radiation on the millsite are expected to decrease to background levels after remediation is completed.

3.2.4 Meteorology

Meteorological monitoring was conducted on the MMTS during 1994 (see Figure 5 for station location). Parameters measured consisted of wind speed, wind direction, standard deviation of wind direction, temperature, barometric pressure, and relative humidity. Collected data were used in the calculation of population dose (see Section 4.3, Off-Site Dose Modeling).

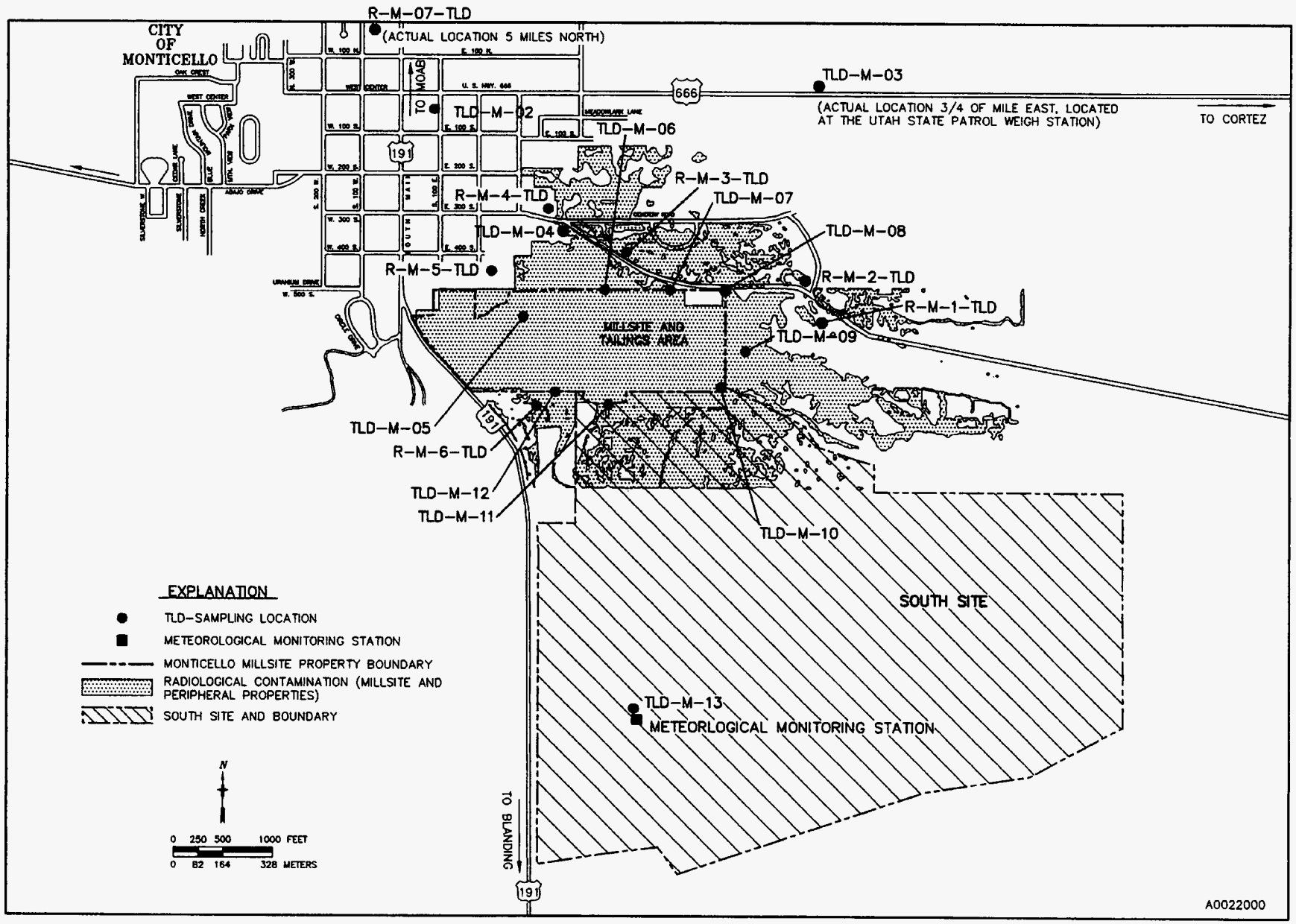

Figure 5. Direct Gamma Radiation and Meteorological Monitoring Locations At and Near MMTS

Table 4. Average Annual Gamma Exposure Rates At and Near MMTS during 1994

Sampling Location	Gamma Exposure	
	Annual Average (mrem/yr)[a]	DOE/EPA Standard (mrem/yr)[b]
On Site		
TLD-M-05	404	199
TLD-M-06	310	199
TLD-M-07	137	199
TLD-M-08	105	199
TLD-M-09	129	199
TLD-M-10	130	199
TLD-M-11	198	199
TLD-M-12	574	199
Off Site		
R-M-1-TLD	114	199
R-M-2-TLD	93	199
R-M-3-TLD	118	199
R-M-4-TLD	113	199
R-M-5-TLD	112	199
R-M-6-TLD	119	199
R-M-7-TLD	89	199
TLD-M-02	102	199
TLD-M-03	97	199
TLD-M-04	116	199
TLD-M-13	109	199

[a]1 mrem/yr = 0.01 millisievert per year.
[b]Standard includes background of 99 mrem/yr.

3.2.5 Surface Water

Montezuma Creek, which flows through the millsite property from west to east, is the primary surface-water feature in the MMTS area. Although generally perennial, the creek's flow can be quite low or dry during the late summer. Montezuma Creek water is diverted and used for irrigation supply about 1.6 kilometers (1 mile) upstream of the millsite. Downstream of the millsite, the creek water is used primarily for livestock watering and irrigation. Other surface-water bodies in the MMTS area include several ponds and seeps.

The primary goals of surface-water sampling at the MMTS are (1) to compare upstream water quality conditions within Montezuma Creek with conditions on and downstream of the millsite, (2) to characterize the type and extent of contamination in surface water, (3) to verify compliance with state surface-water quality standards, and (4) to detect changes in water quality resulting from remedial action.

Utah state regulations (Utah Administrative Code Rule 448-2) place the segment of Montezuma Creek that flows through and below the millsite into four use classifications: Domestic Source 1C, Recreation and Aesthetics 2B, Aquatic Wildlife 3B, and Agriculture. These classifications are associated with specific numeric water quality standards, which are listed in Tables 5 and 6. Water quality data from Montezuma Creek and MMTS ponds and seeps are compared to these standards.

During 1994, upstream surface-water quality samples were collected from Montezuma Creek at three locations designated as SW92-01, SW92-02, and SW92-03 in Figure 6.

On-site surface-water quality samples were collected at eight locations: the drainage between the Carbonate and Vanadium tailings piles (W-2), the seep-fed pond adjacent to the Carbonate tailings pile (Carbonate Seep), the "low spot" between the Carbonate and Vanadium tailings piles (North Drainage), two points on Montezuma Creek (SW92-04 and SW92-05), and three seeps on the hillslope north of the millsite (Pehrson 1, Pehrson 2, and Upper North Drainage) (Figure 6).

Downstream surface-water quality samples were collected from Montezuma Creek at seven locations: W-4, SW92-06, Sorenson Site, SW92-07, SW92-08, SW92-09, and Montezuma Canyon. The last site is approximately 10 kilometers (6 miles) downstream of the millsite (Figure 7).

Water quality samples were collected from upstream, on-site, and downstream locations in May and October 1994. Samples were analyzed for metals (aluminum, arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc), common ions (ammonium, calcium, chloride, fluoride, magnesium, nitrate+nitrite, potassium, sodium, sulfate, and total dissolved solids), and radiological analytes (gross alpha, gross beta, lead-210, polonium-210, radium-226, radium-228, radon-222, thorium-230, thorium-232, uranium-234, uranium-235, and uranium-238). In addition, alkalinity, pH, conductivity, and temperature were measured in the field.

Surface-water samples that required filtration were collected with a peristaltic pump with an in-line 0.45-μm disposable filter. Unfiltered samples were collected by immersing the sample bottle. Sampling procedures and protocol used are described in the *Monticello Mill Tailings Site, Operable Unit III, Surface- and Groundwater Remedial Investigation/Feasibility Study, Field Sampling Plan* (DOE 1992).

Table 5. Comparison of State of Utah Water Quality Standards[a] with 1994 and Historical Maximum Concentrations in Montezuma Creek[b]

Constituent	State Standard		1994 Maximum[c]			Historical Maximum[c,d]		
			Up-stream	On Site	Down-stream	Up-stream	On Site	Down-stream
Common Ions								
Fluoride[e]	1.4-2.4	mg/L	~0.156	~0.103	~0.149	~0.156	~0.139	0.267
Nitrate (as N)[f]	4	mg/L	0.146	0.902	0.943	5.67	2.982	10.007
Total Dissolved Solids	1200	mg/L	1720	1540	1610	1842	1860	1630
Field Measurements								
pH	6.5-9.0		7.96-8.25	7.73-8.06	7.82-9.6	7.2-9.16	6.6-8.67	6.74-9.1
Metals								
Arsenic	0.05	mg/L	~0.0023	0.0114	0.0124	~0.0039	0.0339	0.027
Barium	1.0	mg/L	~0.0926	~0.0748	~0.126	~0.121	0.1	0.12
Boron	0.75	mg/L	~0.0472	~0.0557	~0.0946	0.14	~0.0926	0.13
Cadmium	0.01	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	0.05	mg/L	<0.004	<0.004	0.0263	~0.0049	<0.006	~0.0087
Copper	0.2	mg/L	<0.004	<0.004	~0.0045	~0.0101	~0.017	~0.02
Iron	1.0	mg/L	0.43	0.45	0.581	2.85	1.34	4.45
Lead	0.05	mg/L	<0.001	<0.001	~0.0012	0.0245	0.0051	0.0065
Mercury	0.002	mg/L	---	---	---	<0.0001	~0.0002	<0.0001
Selenium	0.01	mg/L	~0.003	0.009	0.0098	0.0097	0.012	0.042
Silver	0.05	mg/L	<0.004	<0.004	<0.004	<0.007	<0.007	<0.007
Radiological								
Gross Alpha	15	pCi/L	<41	140	264	76	162	517
Gross Beta	50	pCi/L	<35	48	118	26.5	40.	187
Radium-226+228	5	pCi/L	0.13	0.96	1.27	3.3	0.9	1.6
Herbicides								
2,4,5-TP (Silvex)	10	µg/L	---	---	---	<0.22	<0.22	---
2,4-D	100	µg/L	---	---	---	<0.28	<0.28	---
Pesticides and PCBs								
Endrin	0.2	µg/L	---	---	---	<0.1	<0.1	---
Methoxychlor	100	µg/L	---	---	---	<0.52	<0.52	---
Toxaphene	5	µg/L	---	---	---	<5.2	<5.2	---
gamma-BHC (Lindane)	4	µg/L	---	---	---	<0.052	<0.052	---

[a]State of Utah Water Quality Standards for the Montezuma Creek segment, Utah Administrative Code Rule 448-2. Not all state standards are listed in this table.

[b]A "---" indicates no data available; a "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit); a "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[c]The values are in units shown under the State Standard column.

[d]Based on maximum concentrations observed from 1984 through 1993.

[e]Allowable maximum concentration varies according to the daily maximum air temperature.

[f]Nitrate (as N) was derived by using the following conversion: nitrate (as N) = $NO_3 \div 4.427$.

Table 6. Comparison of State of Utah Water Quality Standards[a] with 1994 and Historical Maximum Concentrations in MMTS Ponds and Seeps[b]

Constituent	State Standard		1994 Maximum[c]	Historical Maximum[c,d]
Common Ions				
Fluoride[e]	1.4-2.4	mg/L	1.07	0.891
Nitrate (as N)[f]	4	mg/L	7.29	88.096
Total Dissolved Solids	1200	mg/L	3690	2040
Field Measurements				
pH	6.5-9.0		7.21-9.46	7.30-10.2
Metals				
Arsenic	0.05	mg/L	1.25	5.8
Barium	1.0	mg/L	0.29	0.2
Boron	0.75	mg/L	0.403	0.396
Cadmium	0.01	mg/L	<0.001	<0.001
Chromium	0.05	mg/L	~0.0021	<0.006
Copper	0.2	mg/L	0.0662	~0.0171
Iron	1.0	mg/L	2.06	1.4
Lead	0.05	mg/L	0.0059	~0.0044
Mercury	0.002	mg/L	---	0.00091
Selenium	0.01	mg/L	0.54	3.11
Silver	0.05	mg/L	<0.004	<0.007
Radiological				
Gross Alpha	15	pCi/L	2480	24303
Gross Beta	50	pCi/L	1288	14801
Radium-226+228	5	pCi/L	29.96	23.8
Herbicides				
2,4,5-TP (Silvex)	10	µg/L	---	<0.22
2,4-D	100	µg/L	---	<0.27
Pesticides and PCBs				
Endrin	0.2	µg/L	---	<0.1
Methoxychlor	100	µg/L	---	<0.5
Toxaphene	5	µg/L	---	<5
gamma-BHC (Lindane)	4	µg/L	---	<0.05

[a]State of Utah Water Quality Standards for the Montezuma Creek segment, Utah Administrative Code Rule 448-2. Not all state standards are listed in this table.

[b]A "---" indicates no data available; a "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit); a "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[c]The values are in units shown under the State Standard column.

[d]Based on maximum concentrations observed from 1984 through 1993.

[e]Allowable maximum concentration varies according to the daily maximum air temperature.

[f]Nitrate (as N) was derived by using the following conversion: nitrate (as N) = $NO_3 \div 4.427$.

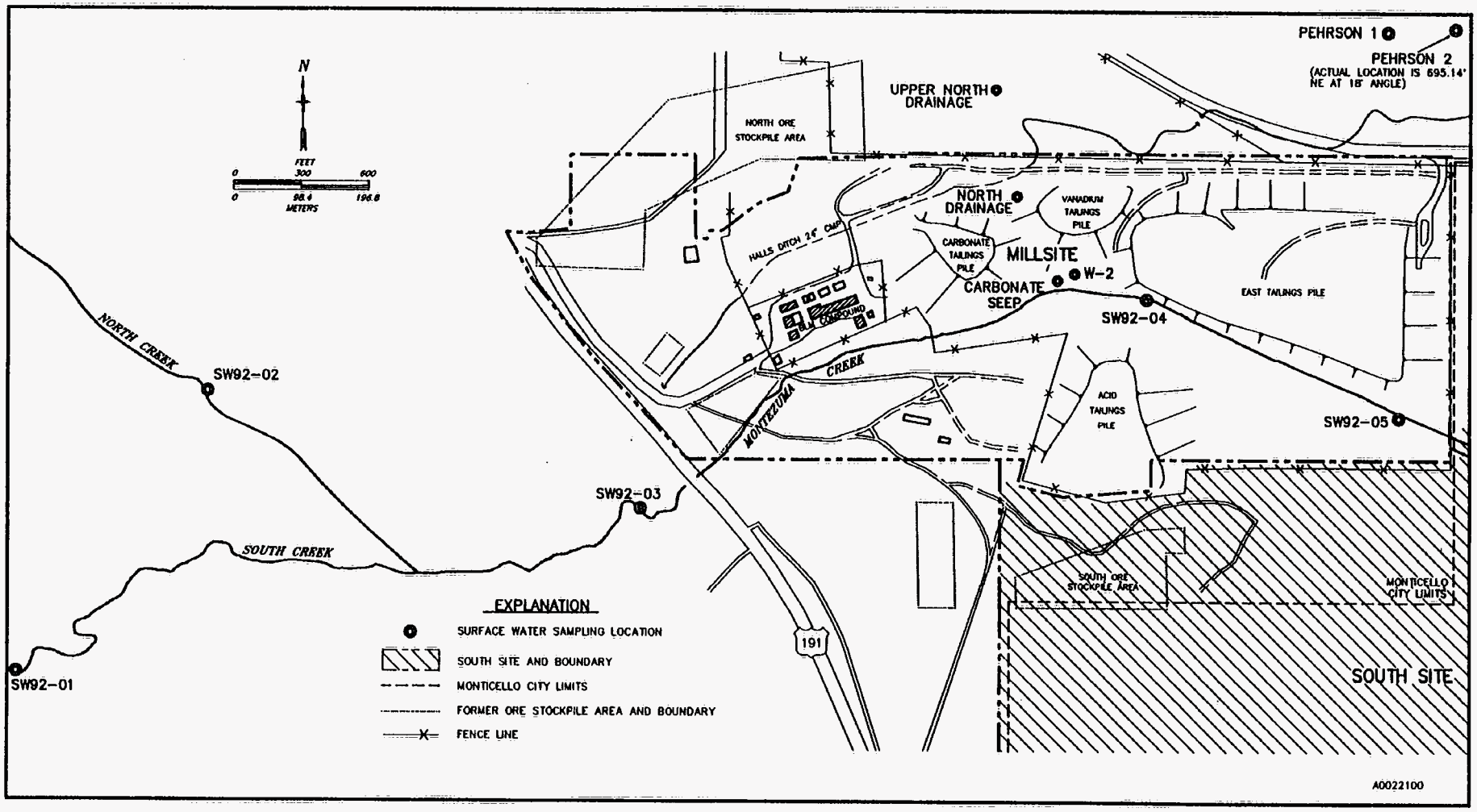

Figure 6. Surface-Water Sampling Locations On and Upstream of MMTS

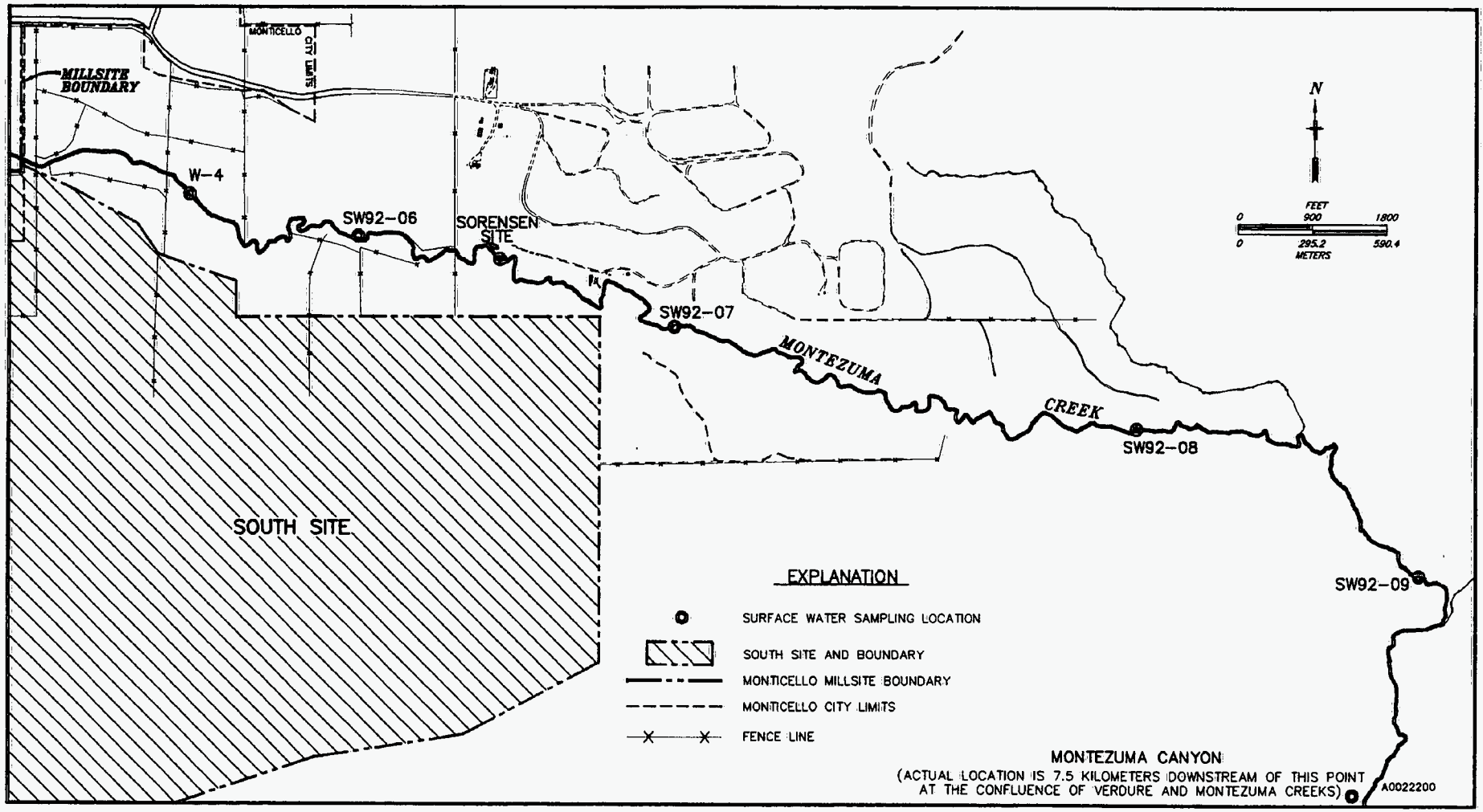

Figure 7. Surface-Water Sampling Locations Downstream of Monticello Millsite

Analytical results of 1994 surface-water sampling are listed in Appendix A, Table A-15. Maximum 1994 and historical analyte concentrations in Montezuma Creek are compared with Utah state standards in Table 5. Analyte concentrations detected in samples from Montezuma Creek upstream of the millsite, with the exception of total dissolved solids (TDS), were below Utah state standards. TDS concentrations exceeded the standard at SW92-01 in May and October.

Standards for TDS (1,200 milligrams per liter [mg/L]) and gross alpha (15 pCi/L) were exceeded in samples from both on-site Montezuma Creek locations SW92-04 and SW92-05. The maximum TDS concentration of 1,540 mg/L was observed in a sample from SW92-05, and the maximum gross alpha activity of 140 pCi/L was observed in a sample from SW92-04.

Downstream of the millsite, standards for pH, TDS, gross alpha, and gross beta were exceeded in samples from Montezuma Creek. The measured pH of 9.6 in a sample from SW92-06 exceeded the pH standard (6.5-9.0). The TDS and gross alpha standards were exceeded in samples from all downstream creek locations during 1994. Maximum concentrations of TDS and gross alpha were measured in samples from Sorenson Site (1,610 mg/L) and SW92-08 (264 pCi/L), respectively. Gross beta concentrations above the state standard were measured in samples from SW92-06, SW92-07, SW92-08, SW92-09, Sorenson Site, and W-4; the maximum gross beta concentration was 118 pCi/L in a sample from the Sorenson Site.

Concentrations of arsenic, gross alpha, gross beta, manganese, nitrate+nitrite, radium-226, selenium, uranium, and vanadium in Montezuma Creek were higher downstream of the millsite than on the millsite. This increase in mill-tailings-related contaminants may be a result of discharge of the contaminated alluvial aquifer into the creek. Seeps from the shallow aquifer are visible along the creek downstream of the eastern millsite boundary, and creek discharge increases throughout this section for approximately 2 kilometers (1.25 miles). Historical assessments of water quality data (DOE 1990a) indicate that the highest concentrations of mill-tailings-related constituents occurred in samples from W-4 or the Sorenson site.

Higher concentrations of mill-tailings-related contaminants were measured in samples from the ponds and seeps on and near the millsite than in samples from Montezuma Creek because the ponds and seeps are surface expressions of the shallow alluvial groundwater (see Section 6.0, Groundwater Monitoring and Protection Program). The pH and concentrations of arsenic, iron, nitrate, selenium, TDS, gross alpha, gross beta, and radium-226+228 exceeded state standards in one or more of the pond and seep samples (Table 6).

Graphs showing the levels of selenium and uranium over time in samples from upstream, on-site, and downstream locations are in Appendix B, Figures B-5 through B-18. Since 1992, selenium concentrations consistently have been below the state standard in samples from the SW92-02 upstream location (Figure B-5). In samples from the Montezuma Creek on-site location SW92-04 and downstream sites W-4 and Sorenson Site

(Figures B-6 to B-8), selenium concentrations have, at times, exceeded the standard. Ten kilometers downstream of the millsite, at the Montezuma Canyon location, selenium concentrations in samples from the creek consistently have been below the state standard (Figure B-9). In samples from the on-site seep locations W-2 and Carbonate Seep (Figures B-10 and B-11), selenium concentrations have usually exceeded the state standard.

Graphs of uranium concentrations in samples from Montezuma Creek (Figures B-12 to B-16) display a pattern similar to the selenium graphs. Concentrations in upstream samples consistently tend to be low, and concentrations in on-site and downstream samples tend to increase. Unlike selenium concentrations, however, uranium concentrations are elevated with respect to background in samples from the furthest downstream monitoring location (Montezuma Canyon). Graphs showing the highest surface-water uranium concentrations, measured in samples from on-site seeps W-2 and Carbonate Seep, are in Figures B-17 and B-18.

3.2.6 Sediment

During the summer of 1994, DOE, EPA, and the state of Utah agreed that radium-226 data obtained from soil and sediment samples previously collected in Montezuma Canyon (DOE 1985 and 1991c) were not sufficiently reliable to describe present-day radium-226 activities. Accurate and up-to-date radiological data were needed to support development of the OU III RI/FS. They therefore agreed to a limited-scale investigation of soil contamination along Montezuma Creek, starting about 590 meters (1,950 feet) east of the millsite and ending just past the Vega Creek confluence, to confirm or qualify the previous data and to provide supporting data for the OU III RI/FS. It was decided that sediment samples from two ponds along Montezuma Creek also would be obtained. Sediment samples were collected from 16 locations at varying depths and were analyzed for metals and radionuclides; analytical data are presented in Appendix A, Tables A-16 and A-17. Interpretation of these data will be included in the draft OU III RI/FS, which will be issued in 1996.

3.3. Environmental Activities Summary

Preliminary fieldwork associated with the OU III ecological risk assessment was conducted in 1994. Habitat and soil types along Montezuma Canyon were delineated, and wildlife species were tentatively selected for future sampling. The final list of species to be sampled will be presented in the OU III RI/FS Revised Draft Work Plan.

A Site-Specific Advisory Board composed of members from southeastern Utah communities and Indian tribes was established to provide input to DOE. The Board contributed to DOE's decision to continue with the proposed action of transporting

tailings to the on-site repository. The Board will continue to interact with DOE on issues concerning the MMTS.

Environmental training courses conducted for workers at the MMTS in compliance with federal regulations and DOE orders consisted of:

- GJPO Environmental Compliance Training
- DOE Pollution Prevention Workshop
- Environmental Awareness Training
- Mixed Waste Management
- Radiological Decontamination
- General Employee Radiological Training
- Radiological Worker
- Radiological Worker Refresher Course
- Radiological Worker Challenge Course
- Field Source Custodian
- Hazardous Waste Site
- Hazardous Waste Site Refresher
- Hazardous Waste Site Supervisor
- Hazard Communication Standard
- Asbestos Abatement Worker/Supervisor/Inspector/Management Planner
- Respiratory Protection
- Emergency Response CADRE
- Emergency Preparedness Training for Security Personnel
- Notification/Occurrence Report

4.0 Environmental Radiological Program Information

4.1 Radioactive Effluent Data

The only significant radioactive effluent released from the MMTS during 1994 was radon-222, which has a half-life of 0.01 year. A radon-flux survey conducted in 1984 (DOE 1990a) revealed that radon emanates from the millsite at a rate of 1,608 curies per year (5.95×10^{13} becquerels per year). Results of the 1994 radiological air particulate monitoring indicated that levels of radium-226, thorium-230, and uranium were well below DCGs (see Section 3.2.2, Air Particulates).

4.2 Environmental Sampling for Radioactivity

Surface water, groundwater, air, and sediments were sampled on the millsite and analyzed for radioactive constituents. Surface-water and groundwater analytes consisted of lead-210, polonium-210, radium-226, radium-228, radon-222, thorium-230, thorium-232, uranium-234, uranium-235, uranium-238, gross alpha, and gross beta. Air was analyzed for radon and for particulates containing radium-226, thorium-230, and uranium. Sediments were analyzed for potassium-40, lead-210, radium-226, thorium-230, and thorium-232. Sampling locations, frequency, methodology, and results are discussed in Section 3.0, Environmental Program Information, and Section 6.0, Groundwater Monitoring and Protection Program, in this report. Also included in these sections are comparisons of measured constituent levels with federal and state regulatory levels.

4.3 Off-Site Dose Modeling

Off-site dose modeling was conducted to estimate the collective population dose caused by radon emissions. The dose assessment model CAP88PC predicted that the collective dose to persons residing within an 80-kilometer radius of the MMTS was 30.22 person-rem per year (0.30 person-sievert per year). Because a reliable source term for radionuclides could not be derived, it was not included in the population dose estimate. However, the population dose that resulted from radionuclide releases was expected to be minimal on the basis of ambient air radionuclide concentrations measured at the site (see Table 3 in this report). The population file used in the dose modeling was compiled from 1990 U.S. Bureau of Census data; the meteorological data file was derived from meteorological data collected at the MMTS during 1994.

Monitoring data collected during 1994 were used to calculate the effective dose equivalent (EDE) to the maximally exposed off-site individual near the MMTS. Calculation of the EDE of the maximally exposed off-site individual living approximately 100 meters north of the site boundary involved summing the radon, air particulate, and gamma source terms at this location. The dose caused by these sources was

10 mrem/yr from radon, 19 mrem/yr from gamma radiation, and 0.5 mrem/yr from radioparticulates. Summing these sources results in a total dose of 29.5 mrem/yr (0.30 millisievert per year) above background, which is below the DOE/EPA standard of 100 mrem/yr above background.

5.0 Environmental Nonradiological Program Information

5.1 Nonradiological Effluent Data

Nonradiological effluent was released in the form of air particulates (PM_{10}) from the MMTS during 1994. Monitoring indicated that PM_{10} levels were below EPA standards (see Section 3.2.2, Air Particulates, for a complete description of the monitoring program).

5.2 Environmental Sampling for Nonradiological Pollution

Sediments, surface water and groundwater were sampled for a variety of nonradiological constituents on and near the MMTS. These sampling programs are described in Section 3.0, Environmental Program Information, and Section 6.0, Groundwater Monitoring and Protection Program, in this report. Comparisons of measured constituent levels with federal and state regulatory levels also are in these sections.

5.3 Superfund Amendments and Reauthorization Act, Title III, Reporting

No Superfund Amendments and Reauthorization Act, Title III, reporting was required at the MMTS.

6.0 Groundwater Monitoring and Protection Program

6.1 Hydrogeology

Two aquifers underlie the Monticello millsite and surrounding area: the upper groundwater flow system (herein referred to as the alluvial aquifer) and the Burro Canyon aquifer. Unconsolidated materials deposited by Montezuma Creek, fill material, weathered bedrock, and hillslope colluvium constitute the alluvial aquifer along the valley bottom. The underlying Burro Canyon aquifer is separated from the alluvial aquifer by variably saturated, low-permeability units constituting the Mancos Shale and Dakota Sandstone (Figure 8).

The alluvial aquifer is approximately 5 meters (16 feet) thick near Montezuma Creek in the vicinity of the Carbonate tailings pile and thins gradually upgradient and downgradient from this location and toward the valley sides. Montezuma Creek is in hydraulic communication with the alluvial aquifer on the upstream side of the East tailings pile. However, the alluvial aquifer and Montezuma Creek are separated in the area adjacent to the East tailings pile because of a realignment of the stream channel. The creek and the aquifer are reunited downstream of the East tailings pile.

Recharge of the alluvial aquifer is from infiltration of precipitation and surface-water inflow. Like the local surface waters, water levels within the aquifer fluctuate seasonally. The alluvial aquifer discharges contaminated groundwater into Montezuma Creek. Transmissivity values for the alluvial aquifer beneath the East tailings pile were determined from a pump test and ranged from 3.3×10^{-4} to 5.4×10^{-4} square meters per second (2,329 to 3,744 gallons per day per foot) (DOE 1991b). As alluvial groundwater moves across the site, it is degraded by constituents such as arsenic, uranium, vanadium, radium, sulfate, selenium, and molybdenum that are leached from the mill tailings. Generally, groundwater flow direction is to the east and southeast. Water from the alluvial aquifer currently is not used for any purpose.

The Burro Canyon is a confined aquifer under the millsite that is separated from the alluvial aquifer by an aquitard consisting of the Mancos Shale, where it has not eroded, and fine-grained units of the Dakota Sandstone. The Burro Canyon aquifer is recharged through the tilted, exposed area of the formation located along the margin of the Abajo Dome west of the millsite. Discharge from the aquifer occurs across the Great Sage Plain east of the millsite, along erosional margins, and in areas where canyons dissect the formation. Numerous stock ponds and marshy areas are created as a result of spring-fed discharge from the aquifer. Water in the Burro Canyon aquifer is used as a domestic water supply source in the Monticello area.

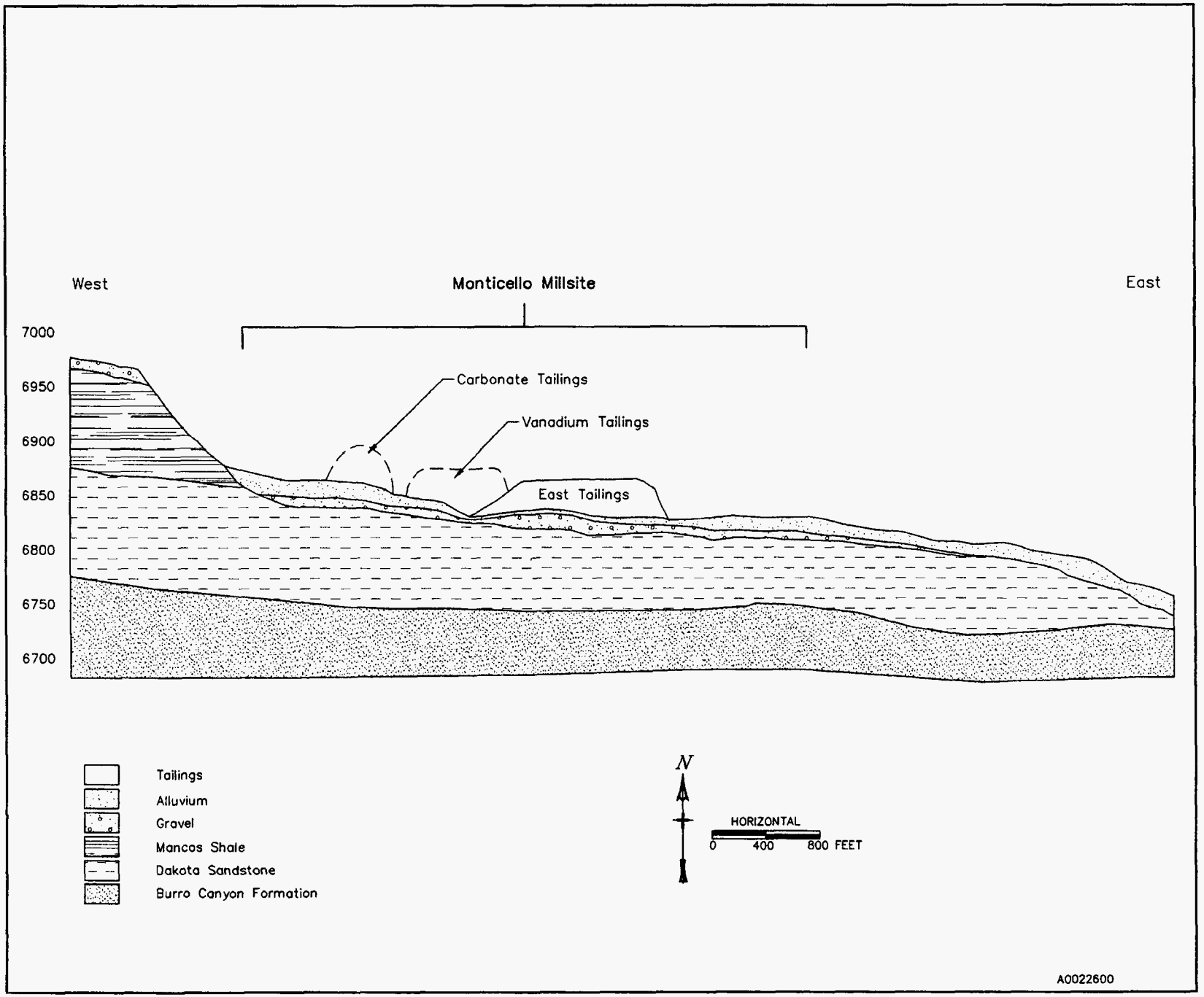

Figure 8. Generalized West-East Cross Section Through Monticello Millsite

6.2 Groundwater Monitoring Program

The objectives of the groundwater monitoring program at the MMTS are (1) to determine the baseline water quality and quantity conditions of the shallow alluvial aquifer, Dakota Sandstone, and the Burro Canyon aquifer underlying the site; (2) to characterize the type and extent of contamination within the alluvial aquifer; (3) to determine if water quality within the Burro Canyon aquifer is being degraded by contaminated alluvial groundwater; (4) to verify compliance with federal and state groundwater quality standards; and (5) to detect changes in water quality resulting from remedial action at the site.

Results of monitoring conducted since 1980 at wells on and downgradient of the millsite have been used to estimate baseline conditions and to characterize contaminant types within the groundwater (Objectives [1] and [2]). Monitoring conducted during the OU III remedial investigation, which commenced in 1993 and continues today, has focused on determining background water quality conditions upgradient of the millsite and providing a better definition of the extent of contamination downgradient of the millsite. On-site and downgradient Burro Canyon water quality data have been compared with background Burro Canyon water quality data to meet Objective (3). To meet Objective (4), measured water quality values have been compared with federal and state standards promulgated by UMTRCA and Title 26, Chapter 11, of the Utah Code Annotated, respectively. The numeric standards that apply to the millsite are listed in Table 7 (Table 7 combines federal and state standards into one list for comparison purposes; federal standards are listed separately in 40 CFR 192.12).

Groundwater sampling in 1994 was conducted in April/May and October. Table 8 lists the wells that were sampled and the analytes measured during each of the sampling events; Table A-18 in Appendix A is the Target Compound List (TCL) of the organic constituents included in the analysis of groundwater samples. Field measurements made at each well included alkalinity, conductivity, dissolved oxygen, oxidation-reduction potential, temperature, and turbidity. Figure 9 shows the sampling locations of upgradient and on-site wells, and Figure 10 shows the sampling locations of downgradient and crossgradient wells.

Groundwater samples were collected with a dedicated bladder pump, submersible pump, or bailer, depending on individual well conditions. Those requiring filtration were run through a 0.45-μm filter in line with the sample container. The sampling procedures and protocol that were used are described in the *Monticello Mill Tailings Site, Operable Unit III, Surface- and Groundwater Remedial Investigation/Feasibility Study, Field Sampling Plan* (DOE 1992). Samples were then analyzed according to procedures prescribed in the *Analytical Chemistry Laboratory Handbook of Analytical and Sample-Preparation Procedures* (Rust Geotech 1994b). Analytical results of all 1994 well samples are in Appendix A, Tables A-19 through A-20. Maximum concentrations of analytes measured in alluvial wells are listed in Table 7 and compared to federal and/or state standards and historical maximums.

Table 7. Comparison of Federal[a] and State of Utah[b] Groundwater Quality Standards with 1994 and Historical Maximum Concentrations in Alluvial Aquifer[c]

Constituent	Federal/State Standard		1994 Maximum[d]			Historical Maximum[d,e]		
			Up-gradient	On Site	Down-gradient	Up-gradient	On Site	Down-gradient
Common Ions								
Fluoride	2.4	mg/L	~0.128	5.66	0.4	~0.199	3.75	0.8
Nitrate (as N)[f]	10.0	mg/L	2.14	43.2	3.7	4.721	60.086	33.308
Field Measurements								
pH	6.5-8.5		6.37-7.23	6.00-8.44	6.08-7.06	6.48-7.21	6.0-8.51	6.0-8.8
Metals								
Arsenic	0.05	mg/L	<0.002	0.611	0.0422	~0.005	1.104	0.131
Barium	1.0	mg/L	~0.0673	0.212	~0.0552	~0.147	0.85	2.25
Cadmium	0.01	mg/L	<0.001	<0.001	<0.001	<0.001	0.005	0.005
Chromium	0.05	mg/L	~0.0043	~0.0087	<0.004	0.0106	0.037	0.0797
Copper	1.0	mg/L	<0.004	0.0769	~0.0111	~0.0061	0.465	0.197
Lead	0.05	mg/L	0.0032	0.0155	~0.0013	0.0113	0.0528	0.0891
Mercury	0.002	mg/L	---	---	---	<0.0001	0.0023	<0.001
Molybdenum	0.1	mg/L	~0.0036	~1.83	0.24	~0.0038	2.15	0.53
Selenium	0.01	mg/L	~0.004	0.144	0.0311	~0.0051	0.302	0.06
Silver	0.05	mg/L	<0.004	~0.001	<0.004	<0.007	~0.0067	<0.025
Zinc	5.0	mg/L	~0.0156	0.0687	~0.0089	0.0405	5.02	0.5
Radiological								
Gross Alpha (excluding radon and uranium)[g]	15	pCi/L	<54	1694.99	234.44	<52	4318.9	333.96
Radium-226+228	5	pCi/L	<4.7	11.57	0.1	0.56	44	1.1
Uranium-234+238[h]	30	pCi/L	8.48	6330.84	1022.73	7.75[i]	8524.8	2264.4
Herbicides								
2,4,5-TP (Silvex)	0.01	mg/L	<0.00022	<0.00021	<0.00021	<0.00022	<0.00022	<0.0002
2,4-D	0.1	mg/L	<0.00027	<0.00027	<0.00027	<0.00027	<0.0004	<0.0004
Pesticides and PCBs								
Endrin	0.0002	mg/L	<0.00011	<0.0001	<0.0001	<0.0001	<0.00011	<0.0001
Methoxychlor	0.1	mg/L	<0.00053	<0.00051	<0.0005	<0.00052	<0.001	<0.001
Toxaphene	0.005	mg/L	<0.0053	<0.0051	<0.005	<0.0052	<0.0056	<0.005
gamma-BHC (Lindane)	0.004	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Semivolatile Organics								
1,4-Dichlorobenzene	0.075	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Volatile Organics								
1,1,1-Trichloroethane	0.200	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethene	0.007	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	0.005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzene	0.005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon Tetrachloride	0.005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethene	0.005	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trihalomethanes[j]	0.1	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vinyl Chloride	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

[a]Standards from the Uranium Mill Tailings Radiation Control Act, revised in 1986.
[b]State of Utah Groundwater Quality Standards, Title 26, Chapter 11, Utah Code Annotated. Not all state standards are listed in this table.
[c]A "---" indicates no data available; a "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit); a "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).
[d]The values are in units shown under the Federal/State Standard column.
[e]Based on maximum concentrations observed from 1984 through 1993.
[f]Nitrate (as N) was derived using the following conversion: nitrate (as N) = $NO_3 \div 4.427$.
[g]Measured values represent total gross alpha minus uranium activity using assumptions in footnote h.
[h]Uranium concentrations, which were measured in milligrams per liter, were converted to picocuries per liter for comparison purposes. The conversion assumes equilibrium and an activity of 0.666 pCi/μg.
[i]Extreme-values testing of uranium results from samples collected in 1993 indicated that a value (155.03 pCi/L) was an outlier; this value from an upgradient well was not included in this table.
[j]Trihalomethanes include bromodichloromethane, bromoform, dibromochloromethane, and chloroform.

Table 8. 1994 Groundwater Sampling and Analytical Design Schedule

Month		Well Sampled	Analytes Measured
April/May	Upgradient	Alluvial: 92-01, 92-03	Cl, Fl, (NO_2+NO_3)-N, SO_4, NH_4, Ca, Mg, K, Na, Al, As, Ba, B, Cd, Cr, Cu, Fe, Pb, Mn, Mo, Ni, Se, Ag, Tl, U, V, Zn, total dissolved solids, gross alpha, gross beta, Pb-210, Po-210, Ra-226, Ra-228, Th-230, Th-232, U-234, U-235, U-238, and Rn-222
		92-05	Volatile organic compounds, semivolatile organic compounds, pesticides, PCBs, herbicides, Cl, Fl, (NO_2+NO_3)-N, SO_4, NH_4, Ca, Mg, K, Na, Al, As, Ba, B, Cd, Cr, Cu, Fe, Pb, Mn, Mo, Ni, Se, Ag, Tl, U, V, Zn, total dissolved solids, gross alpha, gross beta, Pb-210, Po-210, Ra-226, Ra-228, Th-230, Th-232, U-234, U-235, U-238, and Rn-222
		Burro Canyon: 92-02, 92-04, 92-06	Same as upgradient alluvial wells 92-01 and 92-03
		Dakota Sandstone: 92-13	Same as upgradient alluvial wells 92-01 and 92-03
	On Site	Alluvial: 82-31B-E, 82-40A, 82-42 36SE93-201-2	Same as upgradient alluvial wells 92-01 and 92-03
		31SW91-23	Same as upgradient alluvial wells 92-01 and 92-03 with the addition of NO_2
		82-30B, 31SW91-03, 31SW91-14	Same as upgradient well 92-05
		Burro Canyon: 93-01	Same as upgradient alluvial wells 92-01 and 92-03
	Crossgradient	Burro Canyon: 31NE93-205	Same as upgradient alluvial wells 92-01 and 92-03
	Downgradient	Alluvial: 82-07, 92-07, 92-08, 92-09, 92-11	Same as upgradient alluvial wells 92-01 and 92-03
		88-85	Same as upgradient well 92-05
		Burro Canyon: 83-70, 92-10	Same as upgradient alluvial wells 92-01 and 92-03
		Dakota Sandstone: 92-12	Same as upgradient wells 92-01 and 92-03

Table 8 (continued). 1994 Groundwater Sampling and Analytical Design Schedule

Month	Well Sampled		Analytes Measured
October	**Upgradient**	Alluvial: 92-01, 92-03, 92-05	Same as April/May upgradient alluvial wells 92-01 and 92-03
		Burro Canyon: 92-02, 92-04, 92-06	Same as April/May upgradient alluvial wells 92-01 and 92-03
		Dakota Sandstone: 92-13	Same as April/May upgradient alluvial wells 92-01 and 92-03
	On Site	Alluvial: 82-30B, 82-31B-E, 31SW91-03 82-42, 31SW91-14, 82-40A 36SE93-201-2	Same as April/May upgradient alluvial wells 92-01 and 92-03
		31SW91-23	Same as April/May upgradient alluvial wells 92-01 and 92-03 with the addition of NO_2
		Burro Canyon: 93-01	Same as April/May upgradient alluvial wells 92-01 and 92-03
	Crossgradient	Burro Canyon: 31NE93-205	Same as April/May upgradient alluvial wells 92-01 and 92-03
	Downgradient	Alluvial: 82-07, 88-85, 92-07, 92-07, 92-08, 92-11	Same as April/May upgradient alluvial wells 92-01 and 92-03
		Burro Canyon: 83-70, 92-10	Same as April/May upgradient alluvial wells 92-01 and 92-03
		Dakota Sandstone: 92-12	Same as April/May upgradient alluvial wells 92-01 and 92-03

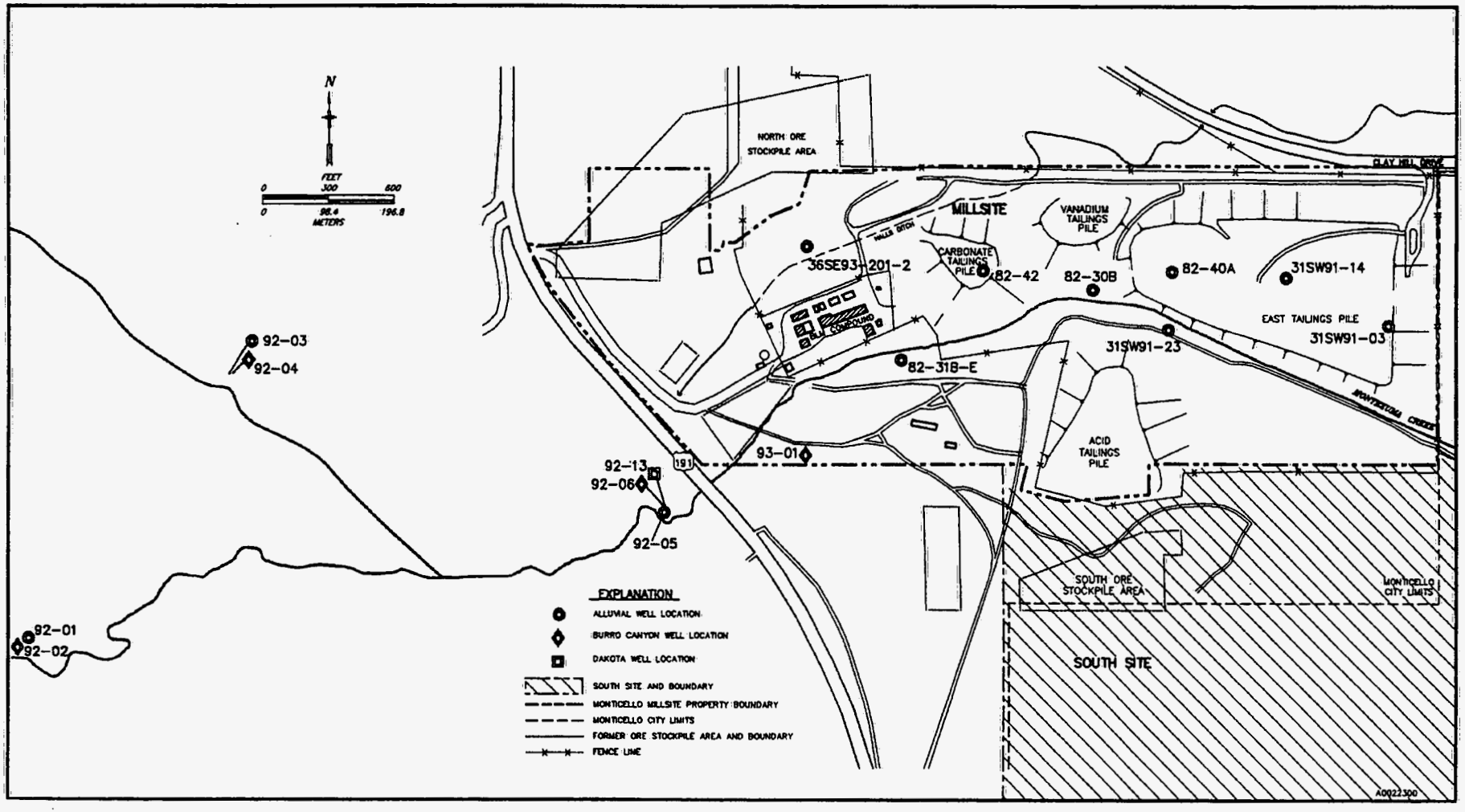

Figure 9. Groundwater Sampling Locations On and Upgradient of Monticello Millsite

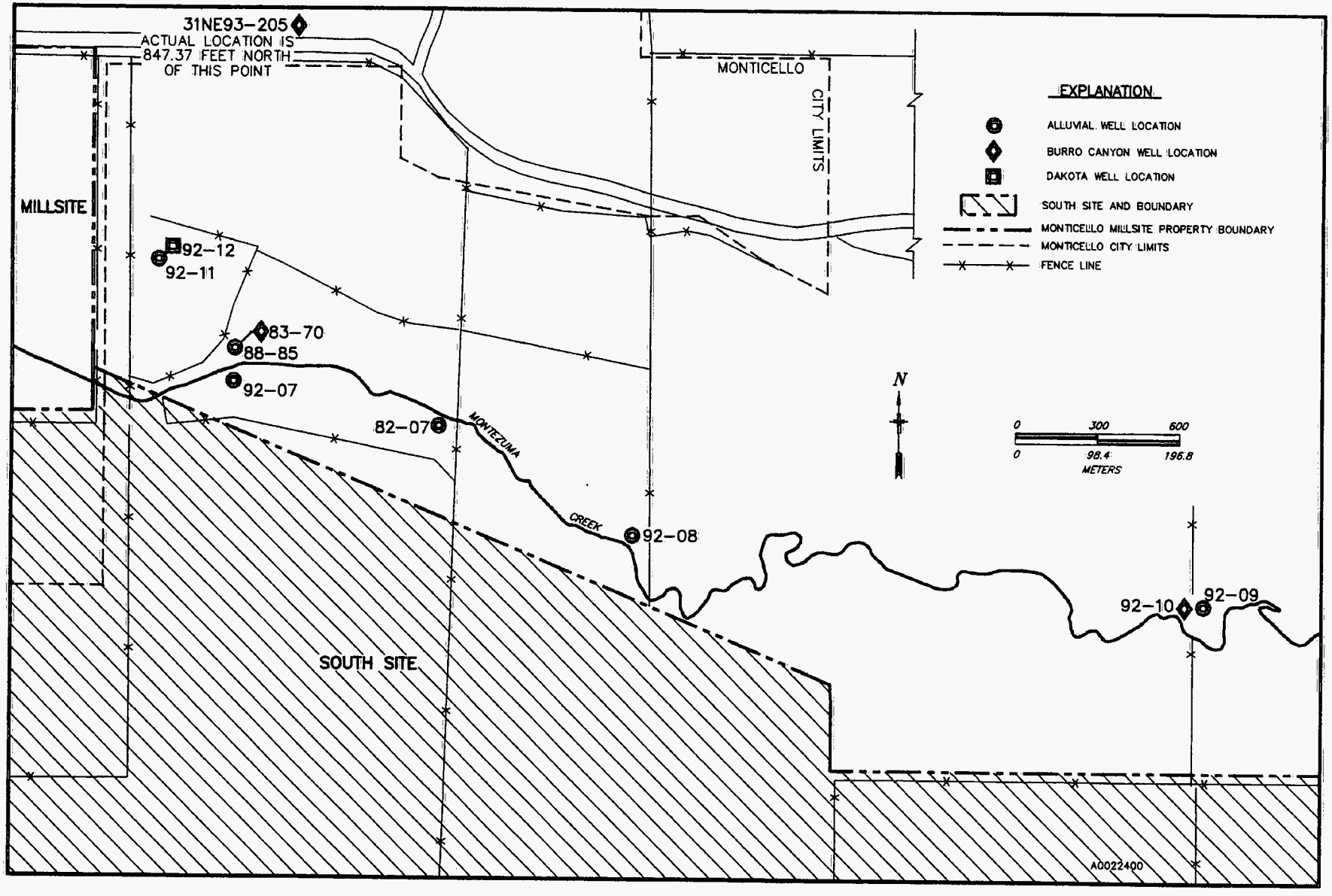

Figure 10. Groundwater Sampling Locations Downgradient and Crossgradient of Monticello Millsite

With a few exceptions, groundwater samples from upgradient alluvial, Burro Canyon, and Dakota Sandstone wells contained analyte concentrations below federal and state standards. A pH measurement of 6.37 measured in a sample from alluvial well 92-01 in May exceeded the state pH standard (6.5-8.5). Concentrations of molybdenum (results of 0.118 and 0.146 mg/L) and pH measurements (results of 10.99 and 9.80) in samples from upgradient Dakota Sandstone well 92-13 exceeded their respective state standards.

On the millsite, alluvial groundwater is contaminated by elements leached from the mill tailings piles. In general, the highest historical contaminant concentrations have been in samples obtained in the vicinity of the Vanadium and East tailings piles. In 1994, samples from wells 36SE93-201-2 and 82-40A contained the highest concentrations of metals and radionuclides. Well 36SE93-201-2, which was installed in 1993, is located on the north hillslope of the millsite in a suspected former ore storage area. Well 82-40A is on the East tailings pile. In samples from one or more of the on-site alluvial wells, the pH and concentrations of arsenic, fluoride, lead, mercury, molybdenum, nitrate, selenium, zinc, gross alpha, radium-226+228, and uranium-234+238 historically have exceeded standards (Table 7). In 1994, the pH and concentrations of arsenic, fluoride, molybdenum, nitrate, selenium, gross alpha, radium-226+228, and uranium-234+238 in samples from on-site alluvial wells exceeded standards. All samples from the on-site Burro Canyon well contained analyte concentrations below the standards.

Samples from downgradient alluvial wells on private property east of the millsite (Figure 10) have provided evidence of contaminant migration. At times in the past, the pH and concentrations of nitrate, arsenic, barium, chromium, lead, molybdenum, selenium, gross alpha, and uranium-234+238 have exceeded standards (Table 7). In 1994, the pH and concentrations of molybdenum, selenium, gross alpha, and uranium-234+238 in samples from downgradient alluvial wells exceeded standards. Uranium-234+238 activity exceeded the UMTRCA standard of 30 pCi/L in samples from all downgradient alluvial wells, including the sample from the easternmost well (well 92-09, 1.3 kilometers east of the millsite boundary). Samples from well 92-09 had an average uranium-234+238 activity of 211 pCi/L.

The radium-226+228 standard of 5 pCi/L was exceeded in a sample from downgradient Burro Canyon well 92-10 (result of 5.75 pCi/L) and crossgradient Burro Canyon well 31NE93-205 (result of 5.42 pCi/L). These results exceeded the standard because the radium-228 component, which is normally below the laboratory detection limit, was above the detection limit. It is believed that these above-detection-limit results are anomalies. Since 1984, 313 groundwater samples (excluding the two mentioned above) from the MMTS study area have been analyzed for radium-228, and only one other sample has been above the laboratory detection limit. All other measurements from downgradient and crossgradient Burro Canyon wells, with the exception of one pH measurement of 6.36 from well 31NE93-205, have been below standards.

A statistical comparison of uranium concentrations in samples from Burro Canyon wells was conducted to determine if the Burro Canyon aquifer has been degraded by contaminated alluvial groundwater. Uranium was the analyte chosen in this study

because (1) uranium concentrations, unlike other contaminant concentrations, were above laboratory detection limits in upgradient Burro Canyon wells (values *below* laboratory detection limits are difficult to evaluate statistically) and (2) uranium is a widespread contaminant in the alluvial aquifer on and downgradient of the millsite. This study showed no significant difference between upgradient and on-site/downgradient uranium concentrations in samples from Burro Canyon wells.

Samples collected from downgradient Dakota Sandstone well 92-12 contained molybdenum and gross alpha in concentrations that exceeded standards. The molybdenum concentrations of 0.109 and 0.101 mg/L are consistent with historical results, but the gross alpha activity of 884 pCi/L is considered to be anomalous. This high gross alpha activity is not substantiated by the low isotopic uranium activity (10 pCi/L) or total uranium concentration (10.8 μg/L) measured in the same sample. Because of the limited amount of Dakota Sandstone water quality data available, it cannot yet be determined whether these excessive concentrations are natural background values, statistical outliers, or a result of tailings contamination.

Maximum concentrations of groundwater analytes that exceeded standards in 1994 are listed for each well in Figures 11 and 12. Concentrations that exceeded standards in the April/May and October sampling events are listed for each well in Appendix C, Figures C-1 through C-4.

Graphical presentations of groundwater data are included in Appendix B of this report and show the variability in data over time and among upgradient, on-site, and downgradient wells. In addition, the data are graphically compared to federal/state standards. Figures B-19 through B-22 illustrate historical and 1994 arsenic concentrations in samples from an upgradient alluvial well, an on-site alluvial well, and two downgradient alluvial wells (one immediately downgradient of the millsite, the other further downgradient). Similar graphs are presented for molybdenum (Figures B-23 through B-26), uranium-234+238 (Figures B-27 through B-30), and radium-226+228 (Figures B-31 through B-34).

Sampling for TCL volatiles, semivolatiles, herbicides, and pesticides/PCBs (see analyte list in Appendix A, Table A-18) in the alluvial aquifer was conducted in May. Five wells were selected from the sampling network and sampled for organic compounds to confirm results of historical monitoring. Significant concentrations of these analytes were not measured in samples from any of the wells. Except for two semivolatile compounds, bis(2-ethylhexyl)phthalate and di-n-butylphthalate, all measured concentrations were below detection limits. Bis(2-ethylhexyl)phthalate (maximum concentration of 21 μg/L) was detected in samples from all five wells analyzed for organic compounds and in the associated laboratory blanks. Di-n-butylphthalate (approximate concentration of 1 μg/L) was detected in a sample from upgradient alluvial well 92-05. These compounds were probably introduced in the sampling and analysis process. Results of organic analyses are listed in Appendix A, Tables A-19 and A-20, and are compared with federal/state standards in Table 7.

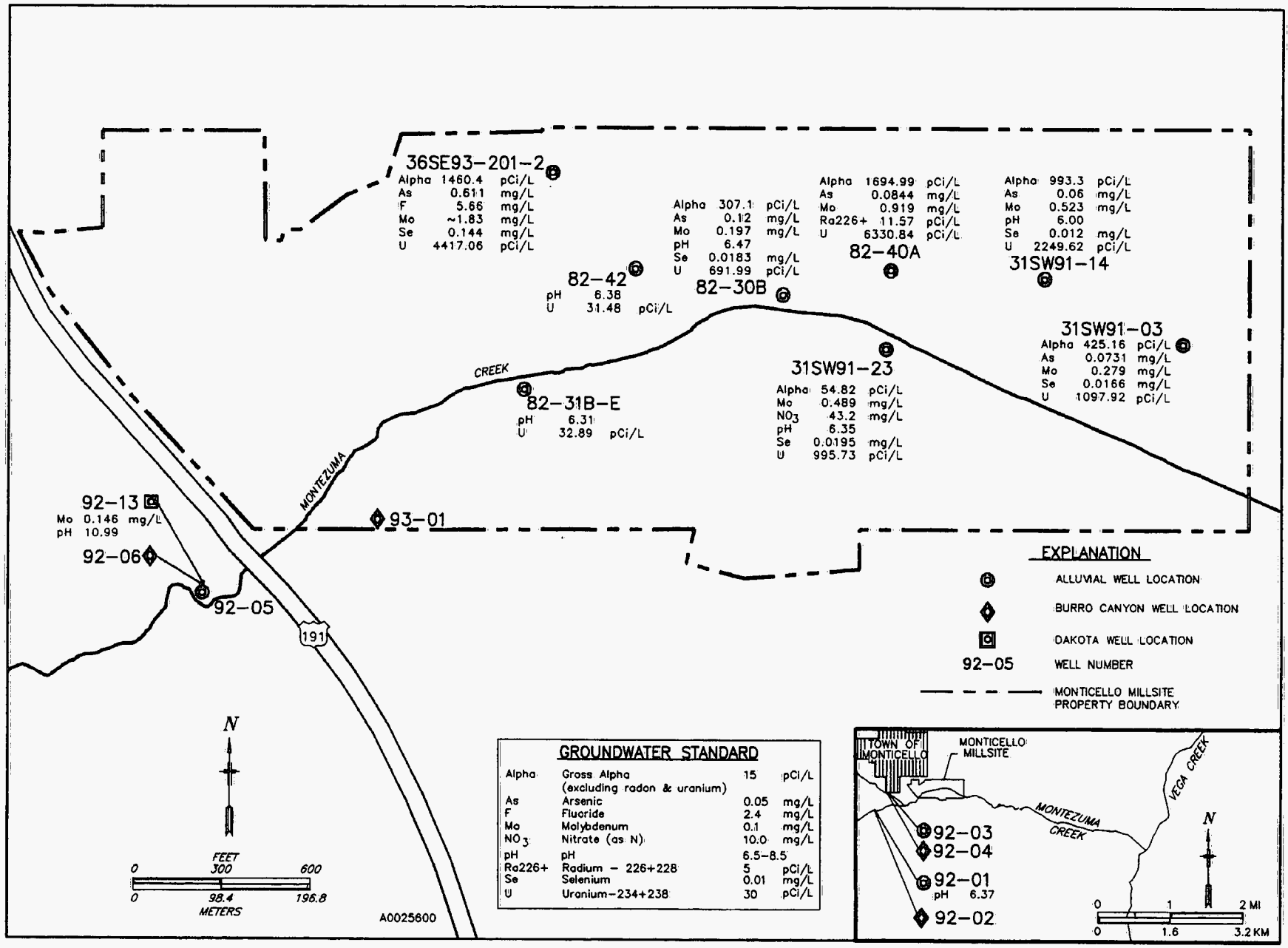

Figure 11. Maximum Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples On and Upgradient of Monticello Millsite

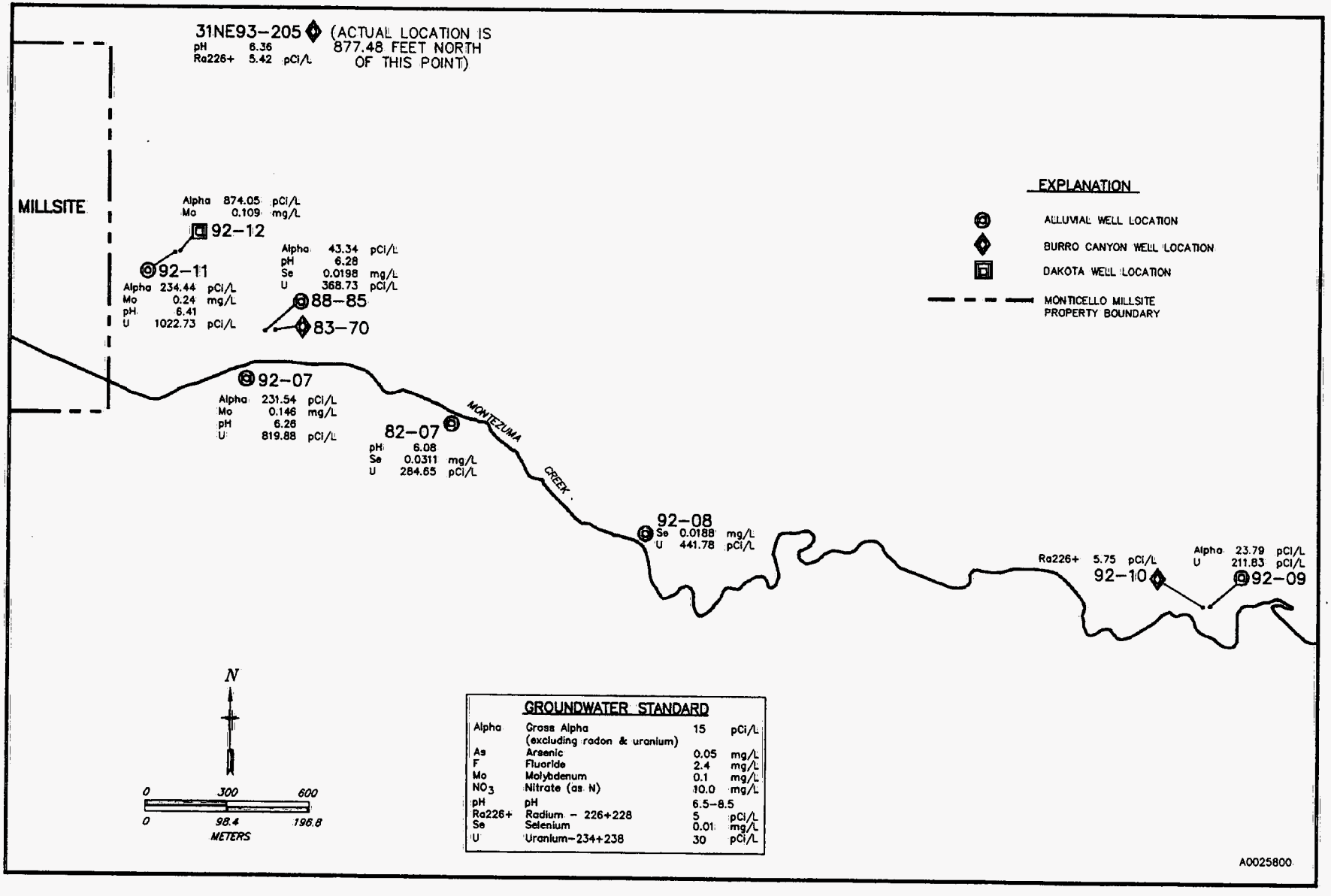

Figure 12. Maximum Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples Downgradient and Crossgradient of Monticello Millsite

Semivolatile compounds that were not TCL constituents, but were detected in the samples, were labeled as "tentatively identified compounds" and are listed in Table A-20. Tentatively identified compounds were labeled as such because the laboratory instrument was not calibrated for that specific compound, which resulted in an estimated concentration. Because of the low estimated concentrations detected (maximum of 10 μg/L), these compounds were not considered potential contaminants in the groundwater.

7.0 Quality Assurance

The DOE-GJPO has a Quality Assurance (QA) Program that is consistent with and responsive to DOE Order 5700.6C, *Quality Assurance,* and that addresses the requirements of the American Society for Mechanical Engineers NQA-1 (1989), *Quality Assurance Program Requirements for Nuclear Facilities*. This program provides a structured approach for the application of QA principles to work performed by DOE and is implemented through the *Quality Assurance Manual* (Rust Geotech 1994e).

A Quality Assurance Program Plan (QAPP) was developed for specific environmental monitoring and surveillance needs at the MMTS and is appended to the Environmental Monitoring Plan (DOE 1994f). The primary purposes of the QAPP are to ensure that environmental data are valid and traceable and that they fulfill the requirements of the program. In addition, the QAPP addresses organizational responsibility, QA procedures, records, and audits. Field and laboratory quality control (QC), chain-of-custody, performance reporting, and independent data verification are addressed by the organizations responsible for the work.

7.1 Sampling

Sampling methodologies used for environmental monitoring at the MMTS are described in the *Environmental Procedures Catalog* (Rust Geotech 1994c) and follow EPA guidance given in *Test Methods for Evaluating Solid Waste* (EPA 1986). QA and QC measures are integrated into all sampling activities to ensure sample representativeness, sample accuracy, sample precision, data comparability, and data completeness. Results of QC data collected during sampling are in Appendix A: field duplicate results are listed along with the environmental data; equipment and trip blank results are listed in Table A-21.

7.2 Laboratory Analysis

The Analytical Chemistry Laboratory performs analyses in support of the environmental monitoring programs and implements QA requirements through the *Analytical Chemistry Laboratory Administrative Plan and Quality Control Procedures* (Rust Geotech 1994a). The Analytical Chemistry Laboratory's objective is to provide high-quality analytical data that adequately meet the environmental monitoring program requirements. This objective is met by implementing laboratory protocol to ensure that a sample will retain its proper identity, analytical results will be obtained and reported correctly, and a well-documented sample history will be maintained. QA measures addressed include organizational responsibility, training and qualification of personnel, laboratory records, records control, laboratory QC, data acceptance, sample analysis, data recording and calculation, data deficiencies, chain-of-custody, procurement of services, and quality assessment. Sampling and analytical methodologies are in the *Analytical Chemistry*

Laboratory Handbook of Analytical and Sample-Preparation Procedures (Rust Geotech 1994b).

The Analytical Chemistry Laboratory maintains an internal QA organization to provide independent data review and evaluation of QC data. The QA staff includes in its audit program an evaluation of the effectiveness of the Analytical Chemistry Laboratory QA program. Subcontracted analytical laboratories are under the supervision of the Analytical Chemistry Laboratory. The Analytical Chemistry Laboratory is responsible for monitoring a subcontracted laboratory's methodologies and sample results and for ensuring that proper QC is practiced.

As mandated by DOE Order 5400.1, the Analytical Chemistry Laboratory participates in the DOE interlaboratory QA program coordinated by the DOE Environmental Measurements Laboratory (EML). This interlaboratory program is designed to test the quality of the environmental measurements being reported to DOE by its contractors. Real or synthetic environmental samples that have been prepared and thoroughly analyzed at the program laboratory are distributed to the contractors for analysis, and the results are compiled for comparison. The Analytical Chemistry Laboratory also participates in two non-DOE interlaboratory QA programs: (1) EPA's Environmental Measurement Systems Laboratory (EMSL) Program for radioactive materials and (2) the National Institute for Occupational Safety and Health Proficiency Analytical Testing Program for airborne metal, silica, and asbestos. A summary of the 1994 Analytical Chemistry Laboratory's results for the EML and EMSL interlaboratory QA programs is in Table 9. The accuracy of the laboratory's results can be evaluated by comparing the reported laboratory values with the reference values listed in Table 9.

7.3 Data Management

Data management objectives for environmental monitoring activities are to maximize the usefulness and protection of important program information and to minimize the record-keeping burden and cost. These objectives were achieved through establishment and implementation of continuous, systematic, and effective controls for each phase of a record's life cycle. Records were stored on paper and electronically in a retrievable state and were protected against deterioration, damage, and loss.

Data management activities included receiving laboratory results, entering data into an ORACLE database, and formatting data for report preparation. All environmental monitoring data were permanently stored in the ORACLE database, which is maintained by DOE-GJPO.

Records generated in support of environmental monitoring activities were subject to the requirements for maximum-level records as specified in the QAPP for the Environmental Monitoring Plan (DOE 1994f) and in Section 13, Records Management, of Rust's *Management Policies Manual* (Rust Geotech 1994d).

Table 9. Summary of Analytical Results for Interlaboratory Quality Assurance Programs

Analysis Date	Matrix	Isotope Analyzed	Reported Value (REP)	Reference Value (REF)	Ratio REP/REF
Environmental Measurements Laboratory (DOE)					
03/94	Air Filter	Mn-54	28.9	33.5	0.86
03/94	Air Filter	Co-57	9.4	12.5	0.75
03/94	Air Filter	Co-60	58.3	70.2	0.83
03/94	Air Filter	Sr-90	0.81	0.716	1.13
03/94	Air Filter	Sb-125	21.2	23.3	0.91
03/94	Air Filter	Cs-137	34.1	40.0	0.85
03/94	Air Filter	Ce-144	66.1	128.	0.52
03/94	Air Filter	Pu-238	0.384	0.334	1.15
03/94	Air Filter	Pu-239	0.352	0.310	1.14
03/94	Air Filter	Am-241	0.388	0.391	0.99
03/94	Air Filter	U-234	0.219	0.197	1.11
03/94	Air Filter	U-238	0.218	0.203	1.07
03/94	Air Filter	U	16.3	15.8	1.03
03/94	Soil	Sr-90	9.3	8.79	1.06
03/94	Soil	Cs-137	158.	141.	1.12
03/94	Soil	Pu-238	11.1	11.2	0.99
03/94	Soil	Pu-239	3.67	3.56	1.03
03/94	Soil	Am-241	1.86	2.03	0.92
03/94	Soil	U-234	32.7	27.1	1.21
03/94	Soil	U-238	32.5	27.1	1.20
03/94	Soil	U	2.50	2.13	1.17
03/94	Vegetation	K-40	1160.	923.	1.26
03/94	Vegetation	Co-60	39.4	34.0	1.16
03/94	Vegetation	Sr-90	569.	575.	0.99
03/94	Vegetation	Cs-137	531.	461.	1.15
03/94	Vegetation	Pu-239	4.	3.90	1.03
03/94	Vegetation	Am-241	2.46	2.57	0.96
03/94	Water	Mn-54	95.7	98.2	0.97
03/94	Water	Co-60	113.	101.	1.12
03/94	Water	Sr-90	33.	28.6	1.15
03/94	Water	Cs-134	168.	154.	1.09
03/94	Water	Cs-137	111.	93.7	1.18
03/94	Water	Pu-238	1.03	0.941	1.09
03/94	Water	Pu-239	0.97	0.956	1.01
03/94	Water	Am-241	0.583	0.545	1.07
03/94	Water	U-234	0.585	0.520	1.13
03/94	Water	U-238	0.57	0.528	1.08
03/94	Water	U	0.0422	0.0413	1.02

Analysis Date	Matrix	Isotope Analyzed	Reported Value (REP)	Reference Value (REF)	Ratio REP/REF
Environmental Monitoring Systems Laboratory (EPA)					
01/14/94	Water	Sr-89	25.33	25.0	1.01
01/14/94	Water	Sr-90	14.33	15.0	0.96
01/28/94	Water	Gr. Alpha	13.	15.0	0.87
01/28/94	Water	Gr. Beta	57.	62.0	0.92
02/11/94	Water	U (nat)	9.87	10.1	0.98
02/11/94	Water	Ra-226	18.4	19.9	0.93
02/11/94	Water	Ra-228	15.6	14.7	1.06
03/04/94	Water	H_3	4991.	4936.0	1.01
03/11/94	Water	Pu-239	26.47	27.6	0.96
06/10/94	Water	Co-60	44.33	50.0	0.89
06/10/94	Water	Zn-65	166.	134.0	1.24
06/10/94	Water	Ru-106	298.67	252.0	1.19
06/10/94	Water	Cs-134	32.	40.0	0.80
06/10/94	Water	Cs-137	50.	49.0	1.02
06/10/94	Water	Ba-133	69.33	98.0	0.71
06/17/94	Water	U (nat)	51.3	52.6	0.98
07/15/94	Water	Sr-89	31.	30.0	1.03
07/15/94	Water	Sr-90	19.33	20.0	0.97
07/22/94	Water	Gr. Alpha	28.33	32.0	0.89
07/22/94	Water	Gr. Beta	12.67	10.0	1.27
08/05/94	Water	H_3	9715.	9951.0	0.98
09/16/94	Water	U (nat)	34.27	35.0	0.98
09/16/94	Water	Ra-226	10.1	10.0	1.01
09/16/94	Water	Ra-228	10.37	10.2	1.02
02/12/94	Air Filter	Gr. Alpha	30.	35.0	0.86
03/05/94	Air Filter	Gr. Beta	53.	56.0	0.95
06/11/94	Air Filter	Sr-90	19.	20.0	0.95
03/05/94	Air Filter	Cs-137	22.33	15.0	1.49

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Grand Junction, CO 81503
(970) 248-6000

Appendix A

Monitoring Data

Table A-1. Radon Data for Monticello, First Quarter 1994
(date installed: 12/29/1993; date removed: 04/06/1994)

Sample Location	Detector Number	Reported Radon[a] Concentration (pCi/L)	Corrected Radon[b] Concentration (pCi/L)	Radon Concentration[c] (μCi/mL)
R-M-1-RN	3808764	0.4	0.4	4E-10
R-M-1-RN	3808802	0.5	0.5	5E-10
R-M-2-RN	3808791	0.5	0.5	5E-10
R-M-2-RN	3808793	0.3	0.3	3E-10
R-M-3-RN	3808766	0.7	0.6	6E-10
R-M-3-RN	3808799	0.6	0.6	6E-10
R-M-4-RN	3808794	0.5	0.5	5E-10
R-M-4-RN	3808800	0.5	0.4	4E-10
R-M-5-RN	3808769	0.3	0.3	3E-10
R-M-5-RN	3808781	0.2	0.2	2E-10
R-M-6-RN	3808776	0.6	0.5	5E-10
R-M-6-RN	3808783	0.4	0.4	4E-10
R-M-7-RN	3808772	0.4	0.4	4E-10
R-M-7-RN	3808784	0.5	0.4	4E-10
RN-M-04	3808761	1.4	1.3	1.3E-09
RN-M-04	3808795	0.9	0.8	8E-10
RN-M-06	3808771	0.8	0.7	7E-10
RN-M-06	3808805	0.8	0.8	8E-10
RN-M-07	3808782	1.1	1.0	1.0E-09
RN-M-07	3808796	1.2	1.1	1.1E-09
RN-M-10	3808760	0.2	0.2	2E-10
RN-M-10	3808804	0.4	0.4	4E-10
RN-M-11	3808779	0.3	0.3	3E-10
RN-M-11	3808787	0.2	0.2	2E-10
RN-M-13	3808770	0.5	0.5	5E-10
RN-M-13	3808797	0.1	<0.1	<1E-10
RN-M-14	3808762	0.2	0.2	2E-10
RN-M-14	3808768	<0.1	<0.1	<1E-10
RN-M-15	3808785	0.2	0.2	2E-10
RN-M-15	3808803	0.3	0.3	3E-10

[a]The reported radon value is the result received from the subcontracted laboratory. A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

[b]The corrected radon value is derived by applying a correction factor to the reported value. The correction factor is the ratio of a known exposure value to the value that is measured and reported.

[c]Scientific notation E-10 = "x 10^{-10}."

Table A-2. Radon Data for Monticello, Second Quarter 1994
(date installed: 04/06/1994; date removed: 07/05/1994)

Sample Location	Detector Number	Reported Radon[a] Concentration (pCi/L)	Corrected Radon[b] Concentration (pCi/L)	Radon Concentration[c] (μCi/mL)
R-M-1-RN	3808806	0.6	0.6	6E-10
R-M-1-RN	3809029	0.7	0.7	7E-10
R-M-2-RN	3808828	0.4	0.4	4E-10
R-M-2-RN	3808850	0.5	0.6	6E-10
R-M-3-RN	3808813	0.7	0.7	7E-10
R-M-3-RN	3809024	0.8	0.9	9E-10
R-M-4-RN	3808820	0.4	0.4	4E-10
R-M-4-RN	3808834	0.5	0.5	5E-10
R-M-5-RN	3809025	0.4	0.4	4E-10
R-M-5-RN	3809037	0.4	0.4	4E-10
R-M-6-RN	3808809	0.4	0.4	4E-10
R-M-6-RN	3809022	0.5	0.5	5E-10
R-M-7-RN	3808861	0.6	0.6	6E-10
R-M-7-RN	3809035	0.7	0.7	7E-10
RN-M-04	3808830	1.4	1.4	1.4E-09
RN-M-04	3809030	1.6	1.6	1.6E-09
RN-M-06	3808814	1.1	1.2	1.2E-09
RN-M-06	3808839	1.6	1.6	1.6E-09
RN-M-07	3808819	1.5	1.6	1.6E-09
RN-M-07	3809023	1.7	1.8	1.8E-09
RN-M-10	3808810	0.5	0.5	5E-10
RN-M-10	3808835	0.3	0.3	3E-10
RN-M-11	3808811	0.5	0.5	5E-10
RN-M-11	3808831	0.4	0.4	4E-10
RN-M-13	3808824	0.5	0.5	5E-10
RN-M-13	3808833	0.6	0.6	6E-10
RN-M-14	3808869	0.3	0.3	3E-10
RN-M-14	3808870	0.7	0.8	8E-10
RN-M-15	3808826	0.4	0.4	4E-10
RN-M-15	3808849	0.6	0.6	6E-10

[a]The reported radon value is the result received from the subcontracted laboratory.

[b]The corrected radon value is derived by applying a correction factor to the reported value. The correction factor is the ratio of a known exposure value to the value that is measured and reported.

[c]Scientific notation E-10 = "x 10^{-10}."

Table A-3. Radon Data for Monticello, Third Quarter 1994
(date installed: 07/05/1994; date removed: 10/04/1994)

Sample Location	Detector Number	Reported Radon[a] Concentration (pCi/L)	Corrected Radon[b] Concentration (pCi/L)	Radon Concentration[c] (μCi/mL)
R-M-1-RN	3866012	0.7	1.0	1.0E-09
R-M-1-RN	3866104	0.5	0.7	7E-10
R-M-2-RN	3866005	0.3	0.3	3E-10
R-M-2-RN	3866072	0.6	0.7	7E-10
R-M-3-RN	3866068	0.4	0.5	5E-10
R-M-3-RN	3866078	0.5	0.7	7E-10
R-M-4-RN	3866018	0.4	0.6	6E-10
R-M-4-RN	3866038	0.6	0.7	7E-10
R-M-5-RN	3865933	0.2	0.2	2E-10
R-M-5-RN	3866019	0.5	0.6	6E-10
R-M-6-RN	3866008	0.3	0.4	4E-10
R-M-6-RN	3866149	0.4	0.5	5E-10
R-M-7-RN	3865977	0.4	0.6	6E-10
R-M-7-RN	3866120	0.5	0.6	6E-10
RN-M-04	3865934	1.6	2.1	2.1E-09
RN-M-04	3866066	1.0	1.4	1.4E-09
RN-M-06	3866096	1.3	1.8	1.8E-09
RN-M-06	3866097	1.5	2.0	2.0E-09
RN-M-07	3866010	1.9	2.5	2.5E-09
RN-M-07	3866056	1.7	2.2	2.2E-09
RN-M-10	3866039	0.3	0.3	3E-10
RN-M-10	3866084	0.5	0.6	6E-10
RN-M-11	3865983	0.1	0.1	1E-10
RN-M-11	3866085	0.1	0.1	1E-10
RN-M-13	3866059	0.1	0.2	2E-10
RN-M-13	3866093	0.3	0.3	3E-10
RN-M-14	3866000	0.1	0.2	2E-10
RN-M-14	3866009	<0.1	<0.1	<1E-10
RN-M-15	3866113	0.1	0.2	2E-10
RN-M-15	3866142	0.5	0.6	6E-10

[a]The reported radon value is the result received from the subcontracted laboratory. A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

[b]The corrected radon value is derived by applying a correction factor to the reported value. The correction factor is the ratio of a known exposure value to the value that is measured and reported.

[c]Scientific notation E-10 = "x 10^{-10}."

Table A-4. Radon Data for Monticello, Fourth Quarter 1994
(date installed: 10/04/1994; date removed: 12/29/1994)

Sample Location	Detector Number	Reported Radon[a] Concentration (pCi/L)	Corrected Radon[b] Concentration (pCi/L)	Radon Concentration[c] (μCi/mL)
R-M-1-RN	3865903	0.8	0.9	9E-10
R-M-1-RN	3866030	0.6	0.6	6E-10
R-M-2-RN	3865917	0.4	0.4	4E-10
R-M-2-RN	3866129	0.6	0.7	7E-10
R-M-3-RN	3865864	0.8	0.8	8E-10
R-M-3-RN	3865927	0.6	0.7	7E-10
R-M-4-RN	3865996	0.4	0.4	4E-10
R-M-4-RN	3865997	0.5	0.6	6E-10
R-M-5-RN	3865979	0.6	0.6	6E-10
R-M-5-RN	3866135	0.5	0.6	6E-10
R-M-6-RN	3865915	0.5	0.6	6E-10
R-M-6-RN	3866070	0.7	0.8	8E-10
R-M-7-RN	3866013	0.6	0.6	6E-10
R-M-7-RN	3866071	0.5	0.5	5E-10
RN-M-04	3865860	0.2	0.2	2E-10
RN-M-04	3866054	0.7	0.7	7E-10
RN-M-06	3866029	0.8	0.9	9E-10
RN-M-06	3866037	0.6	0.7	7E-10
RN-M-07	3866034	1.3	1.4	1.4E-09
RN-M-07	3866082	1.6	1.7	1.7E-09
RN-M-10	3866050	0.4	0.5	5E-10
RN-M-10	3866055	0.4	0.4	4E-10
RN-M-11	3865940	0.4	0.5	5E-10
RN-M-11	3866134	0.5	0.5	5E-10
RN-M-13	3866060	0.2	0.2	2E-10
RN-M-13	3866116	0.7	0.7	7E-10
RN-M-14	3866126	0.2	0.2	2E-10
RN-M-14	3866146	0.4	0.5	5E-10
RN-M-15	3866004	0.3	0.3	3E-10
RN-M-15	3866101	0.8	0.9	9E-10

[a]The reported radon value is the result received from the subcontracted laboratory.

[b]The corrected radon value is derived by applying a correction factor to the reported value. The correction factor is the ratio of a known exposure value to the value that is measured and reported.

[c]Scientific notation E-10 = "x 10^{-10}."

Table A-5. Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-1 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
01/02/1994	01021994-01	6011185	0.960	24.09	0.0016	1
01/08/1994	01081994-01	6011180	0.960	24.08	0.0159	11
01/14/1994	01141994-01	6011179	0.960	24.07	0.0104	8
01/20/1994	01201994-01	6011122	0.960	24.07	0.0142	10
02/01/1994	02011994-01	6011113	0.960	24.09	0.0105	8
02/07/1994	02071994-01	6183200	0.951	24.10	0.0015	1
02/15/1994	02131994-01	6183199	0.951	24.07	0.0075	5
02/19/1994	02191994-01	6183194	0.951	24.08	0.0038	3
02/25/1994	02251994-01	6183189	0.951	24.09	0.0032	2
03/03/1994	03031994-01	6183180	0.951	24.04	0.0094	7
03/09/1994	03091994-01	6183173	0.951	27.05	0.0124	8
03/15/1994	03151994-01	6183171	0.951	24.05	0.0155	11
03/21/1994	03211994-01	6183162	0.951	24.05	0.0114	8
03/27/1994	03271994-01	6183155	0.930	24.10	0.0193	14
04/02/1994	04021994-01	6183103	0.930	24.05	0.0156	12
04/08/1994	04081994-01	6183101	0.930	24.02	0.0022	2
04/14/1994	04141994-01	6181392	0.930	24.04	0.0349	26
04/20/1994	04201994-01	6181382	0.930	24.03	0.0643	48
04/26/1994	04261994-01	6181377	0.930	24.06	0.0046	3
05/02/1994	05021994-01	6181372	0.930	24.05	0.0059	4
05/08/1994	05081994-01	6181371	0.930	24.14	0.0186	14
05/14/1994	05141994-01	6181365	0.923	24.07	0.0424	32
05/20/1994	05201994-01	6184360	0.923	24.08	0.0191	14
05/26/1994	05261994-01	6181322	0.923	24.13	0.0027	2
08/24/1994	08241994-01	6180453	0.891	24.08	0.0179	14
08/30/1994	08301994-01	6180448	0.865	24.08	0.0150	12
09/05/1994	09051994-01	6180443	0.871	24.06	0.0101	8
09/11/1994	09111994-01	6180438	0.871	24.06	0.0057	5
09/17/1994	09171994-01	6180433	0.897	24.02	0.0147	11
09/29/1994	09291994-01	6180421	0.832	23.99	0.0181	15
10/05/1994	10051994-01	6180416	0.934	24.05	0.0070	5
10/11/1994	10111994-01	6180411	0.908	24.03	0.0161	12
10/17/1994	10171994-01	6180406	0.881	23.97	0.0014	1
10/23/1994	10231994-01	6180401	0.924	24.07	0.0057	4
10/29/1994	10291994-01	6179792	0.949	24.04	0.0101	7
11/04/1994	11041994-01	6179786	0.922	24.06	0.0038	3
11/10/1994	11101994-01	6179781	0.960	24.07	0.0083	6
11/16/1994	11161994-01	6179776	0.947	24.07	0.0063	5
11/22/1994	11221994-01	6179771	0.922	24.06	0.0051	4
11/28/1994	11281994-01	6179766	0.922	24.06	0.0050	4

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-6. Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-3 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
01/02/1994	01021994-03	6011184	0.960	23.30	0.0130	10
01/08/1994	01081994-03	6011181	0.960	23.32	0.0087	6
01/14/1994	01141994-03	6011178	0.960	23.32	0.0066	5
01/20/1994	01201994-03	6011121	0.960	23.32	0.0215	16
01/26/1994	01261994-03	6011116	0.960	23.31	0.0016	1
02/01/1994	02011994-03	6011112	0.960	23.32	0.0111	8
02/07/1994	02071994-03	6011101	0.951	23.33	0.0034	3
02/13/1994	02131994-03	6183198	0.951	23.30	0.0090	7
02/19/1994	02191994-03	6183193	0.951	23.32	0.0023	2
02/25/1994	02251994-03	6183188	0.951	23.30	0.0133	10
03/03/1994	03031994-03	6183181	0.951	23.30	0.0207	16
03/09/1994	03091994-03	6183175	0.951	23.30	0.0238	18
03/15/1994	03151994-03	6183170	0.951	23.30	0.0192	14
03/21/1994	03211994-03	6183163	0.951	23.30	0.0065	5
03/27/1994	03271994-03	6183156	0.930	23.32	0.0106	8
04/02/1994	04021994-03	6183106	0.930	23.28	0.0088	7
04/08/1994	04081994-03	6181397	0.930	23.30	0.0009	1
04/14/1994	04141994-03	6181391	0.930	23.27	0.0371	29
04/20/1994	04201994-03	6181383	0.930	23.30	0.0278	21
04/26/1994	04261994-03	6181378	0.930	23.30	0.0038	3
05/02/1994	05021994-03	6181376	0.930	23.30	0.0072	6
05/08/1994	05081994-03	6181370	0.930	23.37	0.0089	7
05/20/1994	05201994-03	6181359	0.935	23.32	0.0076	6
05/26/1994	05261994-03	6181321	0.906	23.28	0.0019	2
06/13/1994	06131994-03	6181305	0.840	23.30	0.0157	13
06/19/1994	06191994-03	6180494	0.812	23.30	0.0113	10
06/25/1994	06251994-03	6180490	0.783	23.28	0.0170	16
07/01/1994	07011994-03	6180489	0.809	23.28	0.0165	15
07/13/1994	07131994-03	6180481	0.809	23.30	0.0299	26
07/19/1994	07191994-03	6180475	0.780	23.30	0.0223	20
07/25/1994	07251994-03	6180423	0.751	23.32	0.0168	16
07/31/1994	07311994-03	6180469	0.751	23.32	0.0166	16
08/06/1994	08061994-03	6180465	0.753	23.30	0.0171	16
08/12/1994	08121994-03	6180461	0.928	23.29	0.0130	10
08/18/1994	08181994-03	6180457	0.928	23.30	0.0260	20
08/24/1994	08241994-03	6180452	0.928	23.30	0.0130	10
08/30/1994	08301994-03	6180447	0.928	23.90	0.0145	11

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-6 (continued). Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-3 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
09/05/1994	09051994-03	6180442	0.933	23.92	0.0099	7
09/11/1994	09111994-03	6180437	0.933	23.90	0.0085	6
09/17/1994	09171994-03	6180432	0.933	23.65	0.0118	9
09/23/1994	09231994-03	6180424	0.933	24.18	0.0103	8
09/29/1994	09291994-03	6180420	1.093	24.28	0.0183	11
10/05/1994	10051994-03	6180415	1.088	24.30	0.0074	5
10/11/1994	10111994-03	6180410	1.088	24.37	0.0160	10
10/17/1994	10171994-03	6180405	1.088	24.18	0.0009	1
10/23/1994	10231994-03	6179796	0.977	24.35	0.0125	9
10/29/1994	10291994-03	6179791	1.008	24.33	0.0184	13
11/04/1994	11041994-03	6179785	0.890	24.23	0.0095	7

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-7. Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-5 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
01/02/1994	01021994-05	6011183	0.960	24.02	0.0235	17
01/08/1994	01081994-05	6011182	0.960	24.00	0.0090	7
01/14/1994	01141994-05	6011124	0.960	24.13	0.0159	11
01/20/1994	01201994-05	6011120	0.960	23.33	0.0335	25
01/26/1994	01261994-05	6011117	0.960	24.00	0.0039	3
02/01/1994	02011994-05	6011105	0.960	23.96	0.0221	16
02/07/1994	02071994-05	6011102	0.951	24.00	0.0046	3
02/13/1994	02131994-05	6183197	0.951	23.98	0.0125	9
02/19/1994	02191994-05	6183192	0.951	23.97	0.0024	2
02/25/1994	02251994-05	6183187	0.951	24.00	0.0199	15
03/09/1994	03091994-05	6183174	0.951	23.97	0.0288	21
03/15/1994	03151994-05	6183169	0.951	23.98	0.0280	20
03/21/1994	03211994-05	6183164	0.951	23.98	0.0067	5
03/27/1994	03271994-05	6183157	0.930	23.98	0.0135	10
04/02/1994	04021994-05	6183105	0.930	23.98	0.0113	8
04/08/1994	04081994-05	6181396	0.930	23.98	0.0023	2
04/14/1994	04141994-05	6181390	0.930	23.97	0.0407	30
04/20/1994	04201994-05	6181385	0.930	23.98	0.0309	23
04/26/1994	04261994-05	6181379	0.930	24.00	0.0020	1
05/02/1994	05021994-05	6181375	0.930	24.00	0.0078	6
05/08/1994	05081994-05	6181368	0.930	23.88	0.0104	8
05/14/1994	05141994-05	6181363	0.917	24.17	0.0149	11
05/20/1994	05201994-05	6181358	0.917	24.00	0.0068	5
05/26/1994	05261994-05	6181320	0.917	24.03	0.0028	2
06/01/1994	06011994-05	6181315	0.909	24.00	0.0132	10
06/07/1994	06071994-05	6181310	0.909	24.03	0.0205	16
06/13/1994	06131994-05	6181306	0.909	24.00	0.0164	13
06/19/1994	06191994-05	6181301	0.909	24.00	0.0099	8
06/25/1994	06251994-05	6180491	0.966	24.02	0.0125	9
07/01/1994	07011994-05	6180488	0.963	24.00	0.0273	20
07/07/1994	07071994-05	6180483	0.963	24.00	0.0188	14
07/13/1994	07131994-05	6180480	0.991	24.02	0.0340	24
07/19/1994	07191994-05	6180474	0.991	24.02	0.0237	17
07/25/1994	07251994-05	6180472	1.019	24.00	0.0253	17
07/31/1994	07311994-05	6180469	1.019	24.00	0.0187	13
08/06/1994	08061994-05	6180464	0.908	24.10	0.0292	22
08/12/1994	08121994-05	6180460	0.884	24.00	0.0169	13
08/18/1994	08181994-05	6180456	0.915	24.00	0.0301	23
08/24/1994	08241994-05	6180451	0.946	24.00	0.0138	10
08/30/1994	08301994-05	6180446	0.915	24.02	0.0105	8

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-7 (continued). Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-5 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
09/05/1994	09051994-05	6180441	0.920	24.00	0.0116	9
09/11/1994	09111994-05	6180436	0.920	24.00	0.0101	8
09/17/1994	09171994-05	6180431	0.920	24.00	0.0134	10
09/29/1994	09291994-05	6180419	0.936	24.00	0.0154	11
10/05/1994	10051994-05	6180414	0.931	24.00	0.0099	7
10/11/1994	10111994-05	6180409	0.931	24.00	0.0146	11
10/17/1994	10171994-05	6180404	0.931	24.02	0.0033	2
10/23/1994	10231994-05	6179795	0.950	24.03	0.0116	8
10/29/1994	10291994-05	6179790	0.965	24.00	0.0217	16
11/04/1994	11041994-05	6179784	0.944	24.00	0.0131	10
11/10/1994	11101994-05	6179779	0.975	24.02	0.0093	7
11/16/1994	11161994-05	6179774	0.975	24.00	0.0115	8
11/22/1994	11221994-05	6179769	0.990	24.00	0.0258	18
11/28/1994	11281994-05	6179764	0.990	24.00	0.0147	10

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-8. Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-6 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
01/14/1994	01141994-06	6011123	0.930	24.11	0.0036	3
01/20/1994	01201994-06	6011110	0.930	24.11	0.0053	4
01/26/1994	01261994-06	6011118	0.930	24.14	0.0008	1
02/01/1994	02011994-06	6011104	0.930	24.09	0.0040	3
02/07/1994	02071994-06	6011103	0.951	24.20	0.0038	3
02/13/1994	02131994-06	6183196	0.951	24.10	0.0033	2
03/15/1994	03151994-06	6183168	0.951	24.10	0.0118	9
03/21/1994	03211994-06	6183165	0.951	24.10	0.0046	3
03/27/1994	03271994-06	6183158	0.930	24.10	0.0073	5
04/02/1994	04021994-06	6183104	0.930	24.10	0.0029	2
04/14/1994	04141994-06	6181389	0.930	24.10	0.0273	20
04/20/1994	04201994-06	6181386	0.930	24.10	0.0194	14
04/26/1994	04261994-06	6181380	0.930	24.00	0.0014	1
05/02/1994	05021994-06	6181374	0.930	24.00	0.0035	3
05/08/1994	05081994-06	6181367	0.930	24.09	0.0059	4
05/14/1994	05141994-06	6181362	0.923	24.12	0.0189	14
05/20/1994	05201994-06	6181357	0.923	24.04	0.0136	10
06/01/1994	06011994-06	6181314	0.889	24.02	0.0125	10
06/07/1994	06071994-06	6181311	0.914	24.05	0.0155	12
06/13/1994	06131994-06	6181307	0.914	24.01	0.0171	13
06/19/1994	06191994-06	6181302	0.940	24.00	0.0102	8
06/25/1994	06251994-06	6180492	0.889	23.97	0.0104	8
07/01/1994	07011994-06	6180487	0.886	23.97	0.0219	17
07/07/1994	07071994-06	6180484	0.835	23.42	0.0113	10
07/13/1994	07131994-06	6180479	0.886	24.05	0.0235	18
07/19/1994	07191994-06	6180477	0.932	23.92	0.0232	17
07/31/1994	07311994-06	6180467	0.932	23.93	0.0120	9
08/06/1994	08061994-06	6180463	0.995	23.94	0.0318	22
08/12/1994	08161994-06	6180459	0.928	23.95	0.0122	9
08/18/1994	08181994-06	6180455	0.928	23.94	0.0403	30
08/24/1994	08241994-06	6180450	0.928	23.93	0.0195	15
08/30/1994	08301994-06	6180445	0.900	23.93	0.0146	11
09/05/1994	09051994-06	6180440	0.934	23.94	0.0078	6
09/11/1994	09111994-06	6180435	0.920	23.94	0.0064	5
09/29/1994	09291994-06	6180418	0.878	23.95	0.0164	13

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-8 (continued). Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-6 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
10/05/1994	10051994-06	6180413	0.917	23.95	0.0088	7
10/11/1994	10111994-06	6180408	0.917	23.92	0.0190	14
10/17/1994	10171994-06	6180403	0.917	23.92	0.0874	66
10/23/1994	10231994-06	6179794	0.935	23.95	0.0078	6
10/29/1994	10291994-06	6179788	0.935	24.00	0.0244	18
11/04/1994	11041994-06	6179783	1.069	23.92	0.0214	14
11/10/1994	11101994-06	6179778	0.976	23.99	0.0235	17
11/16/1994	11161994-06	6179773	0.944	23.93	0.0206	15
11/22/1994	11221994-06	6179768	0.944	23.93	0.0071	5
11/28/1994	11281994-06	6179763	0.944	23.94	0.0155	11

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-9. Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-7 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
02/07/1994	02071994-07	6011114	0.951	24.50	0.0020	1
02/13/1994	02131994-07	6183195	0.951	24.40	0.0023	2
02/19/1994	02191994-07	6183191	0.951	24.30	0.0091	7
02/25/1994	02251994-07	6183185	0.951	24.40	0.0033	2
03/03/1994	03031994-07	6183179	0.951	24.40	0.0061	4
03/09/1994	03091994-07	6183177	0.951	24.40	0.0027	2
03/15/1994	03151994-07	6183167	0.951	24.40	0.0086	6
03/27/1994	03271994-07	6183159	0.930	24.46	0.0081	6
04/02/1994	04021994-07	6183107	0.930	24.41	0.0048	4
04/08/1994	04081994-07	6181394	0.930	24.36	0.0023	2
04/14/1994	04141994-07	6181388	0.930	24.38	0.0444	33
04/20/1994	04201994-07	6181384	0.930	24.38	0.0322	24
04/26/1994	04261994-07	6181381	0.930	24.39	0.0017	1
05/02/1994	05021994-07	6181373	0.930	23.05	0.0065	5
05/08/1994	05081994-07	6181366	0.930	23.05	0.0147	11
05/14/1994	05141994-07	6181361	0.911	24.27	0.0159	12
05/20/1994	05201994-07	6181356	0.879	24.37	0.0040	3
05/26/1994	05261994-07	6181318	0.911	24.39	0.0004	<1
06/01/1994	06011994-07	6181313	0.904	24.37	0.0106	8
06/07/1994	06071994-07	6181312	0.904	24.38	0.0136	10
06/19/1994	06141994-07	6181303	0.904	24.39	0.0101	8
06/25/1994	06251994-07	6180493	0.936	24.38	0.0107	8
07/01/1994	07011994-07	6180486	0.934	24.38	0.0205	15
07/07/1994	07071994-07	6180485	0.966	24.39	0.0106	7
07/13/1994	07131994-07	6180478	0.901	24.02	0.0257	20
07/19/1994	07191994-07	6180476	0.891	23.55	0.0111	9
08/06/1994	08061994-07	6180462	0.865	23.56	0.0185	15
08/12/1994	08121994-07	6180458	0.956	23.58	0.0119	9
08/18/1994	08181994-07	6180454	0.899	23.53	0.0111	9
08/24/1994	08241994-07	6180449	0.956	23.53	0.0077	6
08/30/1994	08301994-07	6180444	0.913	23.53	0.0066	5
09/05/1994	09051994-07	6180439	0.933	23.51	0.0090	7
09/11/1994	09111994-07	6180434	0.933	23.48	0.0074	6
09/17/1994	09171994-07	6180426	0.933	23.52	0.0093	7
09/23/1994	09231994-07	6180422	0.933	23.55	0.0037	3
09/29/1994	09291994-07	6180417	0.905	24.31	0.0095	7

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure. A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

[b]Grams per filter.

Table A-9 (continued). Suspended Particulates (PM_{10}) Data Obtained at Station AIR-M-7 during 1994

Sample Date	Ticket Number	Filter Number	Flow Rate (m^3/min)[a]	Sample Time (hours)	Weight (g/F)[b]	Conc. ($\mu g/m^3$)[a]
10/05/1994	10051994-07	6180412	0.945	23.82	0.0052	4
10/11/1994	10111994-07	6180407	0.945	24.81	0.0108	8
10/17/1994	10171994-07	6180402	0.945	22.82	0.0009	1
10/23/1994	10231994-07	6179793	0.995	23.86	0.0060	4
10/29/1994	10291994-07	6179787	0.977	23.82	0.0119	9
11/04/1994	11041994-07	6179782	0.985	23.81	0.0022	2
11/10/1994	11101994-07	6179777	0.985	23.78	0.0075	5
11/16/1994	11161994-07	6179772	0.985	23.80	0.0157	11
11/22/1994	11221994-07	6179767	1.042	23.82	0.0016	1
11/28/1994	11281994-07	6179762	0.985	23.82	0.0067	5

[a]Volumetric values of flow have been corrected to EPA standard temperature and pressure.
[b]Grams per filter.

Table A-10. Radioparticulate Air Sample Results for 1994[a]

Sample Location	Sample Date	Flow Rate (L/h)[b]	Sample Time (hours)	Radium-226		Thorium-230			Uranium		
				(pCi/F)[c]	(μCi/mL)	(pCi/F)	(μCi/mL)	(pg/mL)[d]	(μg/F)[e]	(μg/m³)	(μCi/mL)[f]
R-M-1-AIR	01/1994	3600	312.5	<0.56	<5.0E-16	0.76	6.8E-16	3.5E-08	~0.32	~2.8E-04	~1.9E-16
R-M-1-AIR	02/1994	3600	619.4	<0.54	<2.4E-16	<0.11	<4.9E-17	<2.5E-09	~0.28	~1.3E-04	~8.7E-17
R-M-1-AIR	03/1994	3600	677.8	<0.77	<3.2E-16	<0.12	<4.9E-17	<2.5E-09	~0.49	~2.0E-04	~1.3E-16
R-M-1-AIR	04/1994	3600	691.4	<0.56	<2.2E-16	<0.17	<6.8E-17	<3.5E-09	~0.65	~2.6E-04	~1.7E-16
R-M-1-AIR	05/1994	3600	479.0	<0.47	<2.7E-16	0.30	1.7E-16	8.8E-09	~0.76	~4.4E-04	~2.9E-16
R-M-1-AIR	07/1994	3600	958.0	<0.34	<9.9E-17	0.56	1.6E-16	8.2E-09	~1.0	~2.9E-04	~1.9E-16
R-M-1-AIR	08/1994	3600	337.0	0.49	4.0E-16	0.18	1.5E-16	7.7E-09	~0.32	~2.6E-04	~1.7E-16
R-M-1-AIR	09/1994	3600	629.0	2.03	9.0E-16	0.33	1.5E-16	7.7E-09	~0.84	~3.7E-04	~2.5E-16
R-M-1-AIR	10/1994	3600	841.0	0.36	1.2E-16	0.30	9.9E-17	5.1E-09	~0.81	~2.7E-04	~1.8E-16
R-M-1-AIR	11/1994	3600	673.0	0.32	1.3E-16	0.22	9.1E-17	4.7E-09	~0.62	~2.6E-04	~1.7E-16
R-M-2-AIR	01/1994	3600	541.0	<0.56	<2.9E-16	<0.14	<7.2E-17	<3.7E-09	~0.48	~2.5E-04	~1.7E-16
R-M-2-AIR	02/1994	3600	377.1	<1.48	<1.1E-15	<0.20	<1.5E-16	<7.7E-09	~0.29	~2.1E-04	~1.4E-16
R-M-2-AIR	03/1994	3600	647.8	<0.60	<2.6E-16	<0.13	<5.6E-17	<2.9E-09	~0.74	~3.2E-04	~2.1E-16
R-M-2-AIR	04/1994	3600	694.7	<0.56	<2.2E-16	<0.16	<6.4E-17	<3.3E-09	~0.81	~3.2E-04	~2.1E-16
R-M-2-AIR	05/1994	3600	475.0	<0.47	<2.7E-16	0.29	1.7E-16	8.8E-09	~0.67	~3.9E-04	~2.6E-16
R-M-2-AIR	06/1994	3600	696.0	<0.26	<1.0E-16	<0.21	<8.4E-17	<4.3E-09	~0.41	~1.6E-04	~1.1E-16
R-M-2-AIR	07/1994	3600	963.0	<0.47	<1.4E-16	0.54	1.6E-16	8.2E-09	~1.3	~3.7E-04	~2.5E-16
R-M-2-AIR	08/1994	3600	458.0	0.32	1.9E-16	0.27	1.6E-16	8.2E-09	~0.52	~3.2E-04	~2.1E-16
R-M-2-AIR	09/1994	3600	693.0	1.18	4.7E-16	0.42	1.7E-16	8.8E-09	~0.81	~3.2E-04	~2.1E-16
R-M-2-AIR	10/1994	3600	841.0	0.56	1.8E-16	0.47	1.6E-16	8.2E-09	~0.93	~3.1E-04	~2.1E-16
R-M-2-AIR	11/1994	3600	673.0	0.32	1.3E-16	0.29	1.2E-16	6.2E-09	~0.60	~2.5E-04	~1.7E-16
R-M-3-AIR	01/1994	3600	542.1	<0.53	<2.7E-16	<0.12	<6.1E-17	<3.1E-09	~0.36	~1.8E-04	~1.2E-16
R-M-3-AIR	02/1994	3600	618.8	<1.07	<4.8E-16	<0.19	<8.5E-17	<4.4E-09	~0.30	~1.3E-04	~8.7E-17
R-M-3-AIR	03/1994	3600	676.2	<0.56	<2.3E-16	<0.13	<5.3E-17	<2.7E-09	~0.52	~2.1E-04	~1.4E-16
R-M-3-AIR	04/1994	3600	693.6	<0.53	<2.1E-16	<0.16	<6.4E-17	<3.3E-09	~0.64	~2.6E-04	~1.7E-16
R-M-3-AIR	05/1994	3600	644.5	<0.47	<2.0E-16	0.16	6.9E-17	3.6E-09	~0.65	~2.8E-04	~1.9E-16
R-M-3-AIR	06/1994	3600	700.0	<0.31	<1.2E-16	<0.23	<9.1E-17	<4.7E-09	No Data	No Data	No Data
R-M-3-AIR	07/1994	3600	918.0	<0.39	<1.2E-16	0.73	2.2E-16	1.1E-08	~1.2	~3.6E-04	~2.4E-16
R-M-3-AIR	08/1994	3600	649.0	0.34	1.5E-16	0.73	3.1E-16	1.6E-08	~1.1	~4.7E-04	~3.1E-16
R-M-3-AIR	09/1994	3600	694.0	0.66	2.6E-16	0.52	2.1E-16	1.1E-08	~0.92	~3.7E-04	~2.5E-16
R-M-3-AIR	10/1994	3600	841.0	0.47	1.6E-16	0.52	1.7E-16	8.8E-09	~1.0	~3.3E-04	~2.2E-16
R-M-3-AIR	11/1994	3600	673.0	0.41	1.7E-16	0.25	1.0E-16	5.2E-09	~0.72	~3.0E-04	~2.0E-16
R-M-4-AIR	01/1994	3600	541.6	<0.52	<2.7E-16	<0.14	<7.2E-17	<3.7E-09	~0.38	~1.9E-04	~1.3E-16
R-M-4-AIR	02/1994	3600	616.5	<0.43	<1.9E-16	<0.11	<5.0E-17	<2.6E-09	~0.40	~1.8E-04	~1.2E-16
R-M-4-AIR	03/1994	3600	678.3	<0.56	<2.3E-16	<0.15	<6.1E-17	<3.1E-09	~0.62	~2.5E-04	~1.7E-16
R-M-4-AIR	04/1994	3600	650.7	<1.63	<7.0E-16	<0.16	<6.8E-17	<3.5E-09	~0.65	~2.8E-04	~1.9E-16
R-M-4-AIR	05/1994	3600	528.0	<0.56	<2.9E-16	<0.11	<5.8E-17	<3.0E-09	~0.59	~3.1E-04	~2.1E-16
R-M-4-AIR	06/1994	3600	698.5	<0.28	<1.1E-16	<0.13	<5.2E-17	<2.7E-09	No Data	No Data	No Data
R-M-4-AIR	07/1994	3600	882.0	<0.39	<1.2E-16	0.58	1.8E-16	9.3E-09	~1.4	~4.4E-04	~2.9E-16
R-M-4-AIR	08/1994	3600	649.0	0.25	1.1E-16	0.38	1.6E-16	8.2E-09	~0.89	~3.8E-04	~2.5E-16
R-M-4-AIR	09/1994	3600	568.0	0.36	1.8E-16	0.33	1.6E-16	8.2E-09	~0.78	~3.8E-04	~2.5E-16
R-M-4-AIR	10/1994	3600	841.0	0.36	1.2E-16	0.49	1.6E-16	8.2E-09	~1.0	~3.3E-04	~2.2E-16
R-M-4-AIR	11/1994	3600	602.0	0.28	1.3E-16	0.22	1.0E-16	5.2E-09	~0.65	~3.0E-04	~2.0E-16

[a] A "<" indicates that the maximum concentration was below detection limits (number show is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instument was calibrated.

[b] L/h = liters per hour.

[c] pCi/F = picocuries per filter.

[d] pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194 μCi/μg.

[e] μg/F = micrograms per filter.

[f] The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.666 pCi/μg.

Table A-10 (continued). Radioparticulate Air Sample Results for 1994[a]

Sample Location	Sample Date	Flow Rate (L/h)[b]	Sample Time (hours)	Radium-226		Thorium-230			Uranium		
				(pCi/F)[c]	(μCi/mL)	(pCi/F)	(μCi/mL)	(pg/mL)[d]	(μg/F)[e]	(μg/m³)	(μCi/mL)[f]
R-M-5-AIR	01/1994	3600	541.7	<0.44	<2.3E-16	<0.11	<5.6E-17	<2.9E-09	~0.38	~1.9E-04	~1.3E-16
R-M-5-AIR	02/1994	3600	333.2	<0.63	<5.3E-16	<0.11	<9.2E-17	<4.7E-09	~0.35	~2.9E-04	~1.9E-16
R-M-5-AIR	03/1994	3600	661.3	<0.53	<2.2E-16	<0.12	<5.0E-17	<2.6E-09	~0.56	~2.4E-04	~1.6E-16
R-M-5-AIR	04/1994	3600	694.9	<0.78	<3.1E-16	<0.13	<5.2E-17	<2.7E-09	~0.69	~2.8E-04	~1.9E-16
R-M-5-AIR	05/1994	3600	567.3	<0.40	<2.0E-16	0.27	1.3E-16	6.7E-09	~0.63	~3.1E-04	~2.1E-16
R-M-5-AIR	06/1994	3600	673.5	<0.30	<1.2E-16	<0.20	<8.2E-17	<4.2E-09	No Data	No Data	No Data
R-M-5-AIR	07/1994	3600	867.5	<0.36	<1.2E-16	0.44	1.4E-16	7.2E-09	~1.2	~3.8E-04	~2.5E-16
R-M-5-AIR	08/1994	3600	649.0	0.32	1.4E-16	0.45	1.9E-16	9.8E-09	~0.86	~3.7E-04	~2.5E-16
R-M-5-AIR	09/1994	3600	694.0	0.58	2.3E-16	0.47	1.9E-16	9.8E-09	~0.83	~3.3E-04	~2.2E-16
R-M-5-AIR	10/1994	3600	730.0	0.54	2.1E-16	0.52	2.0E-16	1.0E-08	~1.2	~4.6E-04	~3.1E-16
R-M-5-AIR	11/1994	3600	674.0	0.32	1.3E-16	0.34	1.4E-16	7.2E-09	~0.78	~3.2E-04	~2.1E-16
R-M-6-AIR	01/1994	3600	542.1	<1.46	<7.5E-16	<0.22	<1.1E-16	<5.7E-09	~0.50	~2.6E-04	~1.7E-16
R-M-6-AIR	02/1994	3600	617.1	<0.46	<2.1E-16	<0.09	<4.1E-17	<2.1E-09	~0.31	~1.4E-04	~9.3E-17
R-M-6-AIR	03/1994	3600	678.0	<0.53	<2.2E-16	<0.17	<7.0E-17	<3.6E-09	~0.54	~2.2E-04	~1.5E-16
R-M-6-AIR	04/1994	3600	654.2	<0.59	<2.5E-16	<0.22	<9.3E-17	<4.8E-09	~0.59	~2.5E-04	~1.7E-16
R-M-6-AIR	05/1994	3600	615.0	<0.34	<1.5E-16	0.23	1.0E-16	5.2E-09	~0.58	~2.6E-04	~1.7E-16
R-M-6-AIR	06/1994	3600	675.5	<0.27	<1.1E-16	<0.26	<1.1E-16	<5.7E-09	No Data	No Data	No Data
R-M-6-AIR	07/1994	3600	985.0	4.38	1.2E-15	4.53	1.3E-15	6.7E-08	8.0	2.3E-03	1.5E-15
R-M-6-AIR	08/1994	3600	649.0	1.04	4.5E-16	2.82	1.2E-15	6.2E-08	5.2	2.2E-03	1.5E-15
R-M-6-AIR	09/1994	3600	405.0	0.70	4.8E-16	0.46	3.2E-16	1.6E-08	~0.97	~6.7E-04	~4.5E-16
R-M-6-AIR	10/1994	3600	424.0	0.43	2.8E-16	0.44	2.9E-16	1.5E-08	~1.1	~7.2E-04	~4.8E-16
R-M-6-AIR	11/1994	3600	674.0	0.29	1.2E-16	0.27	1.1E-16	5.7E-09	~0.67	~2.8E-04	~1.9E-16
R-M-7-AIR	01/1994	3600	542.4	<1.06	<5.4E-16	<0.13	<6.7E-17	<3.5E-09	~0.56	~2.9E-04	~1.9E-16
R-M-7-AIR	02/1994	3600	619.0	<0.43	<1.9E-16	<0.11	<4.9E-17	<2.5E-09	~0.29	~1.3E-04	~8.7E-17
R-M-7-AIR	03/1994	3600	673.3	<0.64	<2.6E-16	<0.16	<6.6E-17	<3.4E-09	~0.49	~2.0E-04	~1.3E-16
R-M-7-AIR	04/1994	3600	440.8	<1.56	<9.8E-16	<0.15	<9.5E-17	<4.9E-09	~0.53	~3.3E-04	~2.2E-16
R-M-7-AIR	05/1994	3600	644.0	3.64	1.6E-15	0.41	1.8E-16	9.3E-09	~0.54	~2.3E-04	~1.5E-16
R-M-7-AIR	06/1994	3600	670.0	<0.10	<4.1E-17	<0.25	<1.0E-16	<5.2E-09	No Data	No Data	No Data
R-M-7-AIR	07/1994	3600	894.0	<1.06	<3.3E-16	0.65	2.0E-16	1.0E-08	~0.74	~2.3E-04	~1.5E-16
R-M-7-AIR	08/1994	3600	483.0	0.33	1.9E-16	0.28	1.6E-16	8.2E-09	~0.37	~2.1E-04	~1.4E-16
R-M-7-AIR	09/1994	3600	694.0	0.66	2.6E-16	0.46	1.8E-16	9.3E-09	~0.72	~2.9E-04	~1.9E-16
R-M-7-AIR	10/1994	3600	730.0	0.28	1.1E-16	0.31	1.2E-16	6.2E-09	~0.84	~3.2E-04	~2.1E-16
R-M-7-AIR	11/1994	3600	672.0	0.30	1.2E-16	0.24	9.9E-17	5.1E-09	~0.56	~2.3E-04	~1.5E-16

[a] A "<" indicates that the maximum concentration was below detection limits (number show is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instument was calibrated.

[b] L/h = liters per hour.

[c] pCi/F = picocuries per filter.

[d] pg/mL = picograms per milliliter. The conversion of thorium-230 concentrations between microcuries and picograms assumed equilibrium and an activity of 0.0194 μCi/μg.

[e] μg/F = micrograms per filter.

[f] The conversion of uranium concentrations between microcuries per milliliter and micrograms per cubic meter assumed equilibrium and an activity of 0.666 pCi/μg.

Table A-11. Direct Gamma Radiation Data for Monticello, First Quarter 1994

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-12	04/28/1994	12/30/1993	04/06/1994	98

TLD ID	Field Location	Reported Value[a] for Quarter (mrem)	Corrected Value[b] Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-5	R-M-1-TLD	36.7	0.4	137
GJ-9	R-M-2-TLD	29.3	0.3	109
GJ-17	R-M-3-TLD	31.3	0.3	117
GJ-18	R-M-4-TLD	32.3	0.3	120
GJ-2	R-M-5-TLD	30.6	0.3	114
GJ-16	R-M-6-TLD	30.8	0.3	115
GJ-6	R-M-7-TLD	28.0	0.3	104
GJ-4	TLD-M-02	28.5	0.3	106
GJ-13	TLD-M-03	25.9	0.3	96
GJ-12	TLD-M-04	29.7	0.3	111
GJ-1	TLD-M-05	103.8	1.1	387
GJ-8	TLD-M-06	92.4	0.9	344
GJ-20	TLD-M-06[c]	87.0	0.9	324
GJ-7	TLD-M-07	38.0	0.4	142
GJ-3	TLD-M-08	32.5	0.3	121
GJ-10	TLD-M-09	57.9	0.6	216
GJ-19	TLD-M-10	37.1	0.4	138
GJ-15	TLD-M-11	48.0	0.5	179
GJ-14	TLD-M-12	120.2	1.2	448
GJ-21	TLD-M-13	30.6	0.3	114

[a]The reported values are the results received from the subcontracted laboratory.

[b]The corrected values are derived by subtracting the exposure received by the TLDs while in transit from the reported values.

[c]Duplicate sample.

Table A-12. Direct Gamma Radiation Data for Monticello, Second Quarter 1994

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-13	08/08/1994	04/06/1994	07/05/1994	90

TLD ID	Field Location	Reported Value[a] for Quarter (mrem)	Corrected Value[b] Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-21	R-M-1-TLD	32.4	0.4	131
GJ-38	R-M-2-TLD	23.2	0.3	94
GJ-32	R-M-3-TLD	29.6	0.3	120
GJ-22	R-M-4-TLD	32.2	0.4	131
GJ-25	R-M-5-TLD	30.0	0.3	122
GJ-33	R-M-6-TLD	37.8	0.4	153
GJ-18	R-M-7-TLD	25.0	0.3	101
GJ-30	TLD-M-02	28.9	0.3	117
GJ-26	TLD-M-03	28.7	0.3	116
GJ-29	TLD-M-04	32.3	0.4	131
GJ-34	TLD-M-05	108.8	1.2	441
GJ-24	TLD-M-06	81.6	0.9	331
GJ-28	TLD-M-06[c]	83.4	0.9	338
GJ-35	TLD-M-07	38.8	0.4	157
GJ-37	TLD-M-08	26.3	0.3	107
GJ-23	TLD-M-10	34.7	0.4	141
GJ-19	TLD-M-11	50.4	0.6	204
GJ-40	TLD-M-12	131.8	1.5	535
GJ-36	TLD-M-13	28.0	0.3	114

[a]The reported values are the results received from the subcontracted laboratory.

[b]The corrected values are derived by subtracting the exposure received by the TLDs while in transit from the reported values.

[c]Duplicate sample.

Table A-13. Direct Gamma Radiation Data for Monticello, Third Quarter 1994

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-14	11/03/1994	07/05/1994	10/04/1994	91

TLD ID	Field Location	Reported Value[a] for Quarter (mrem)	Corrected Value[b] Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-9	R-M-1-TLD	27.6	0.3	111
GJ-26	R-M-1-TLD[c]	23.5	0.3	94
GJ-15	R-M-2-TLD	22.1	0.2	89
GJ-40	R-M-2-TLD[c]	18.0	0.2	72
GJ-10	R-M-3-TLD	26.7	0.3	107
GJ-22	R-M-3-TLD[c]	31.4	0.3	126
GJ-2	R-M-4-TLD	26.0	0.3	104
GJ-25	R-M-4-TLD[c]	26.0	0.3	104
GJ-5	R-M-5-TLD	32.2	0.4	129
GJ-12	R-M-5-TLD[c]	23.6	0.3	95
GJ-28	R-M-6-TLD	27.2	0.3	109
GJ-32	R-M-6-TLD[c]	31.1	0.3	125
GJ-13	R-M-7-TLD	18.7	0.2	75
GJ-38	R-M-7-TLD[c]	20.0	0.2	80
GJ-6	TLD-M-02	26.3	0.3	105
GJ-37	TLD-M-02[c]	22.2	0.2	89
GJ-11	TLD-M-03	21.6	0.2	87
GJ-31	TLD-M-03[c]	22.6	0.2	91
GJ-17	TLD-M-04	28.3	0.3	114
GJ-36	TLD-M-04[c]	26.1	0.3	105
GJ-24	TLD-M-05	98.4	1.1	395
GJ-34	TLD-M-05[c]	94.6	1.0	379
GJ-14	TLD-M-06	74.9	0.8	300
GJ-33	TLD-M-06[c]	72.3	0.8	290
GJ-23	TLD-M-07	33.5	0.4	134
GJ-29	TLD-M-07[c]	31.0	0.3	124
GJ-8	TLD-M-08	27.7	0.3	111
GJ-18	TLD-M-08[c]	24.7	0.3	99
GJ-1	TLD-M-09	26.1	0.3	105
GJ-35	TLD-M-09[c]	24.6	0.3	99
GJ-4	TLD-M-10	32.8	0.4	132
GJ-7	TLD-M-10[c]	33.3	0.4	134
GJ-16	TLD-M-11	49.2	0.5	197
GJ-39	TLD-M-11[c]	45.1	0.5	181
GJ-20	TLD-M-12	195.3	2.1	783
GJ-30	TLD-M-12[c]	182.3	2.0	731
GJ-3	TLD-M-13	27.4	0.3	110
GJ-21	TLD-M-13[c]	26.1	0.3	105

[a]The reported values are the results received from the subcontracted laboratory.

[b]The corrected values are derived by subtracting the exposure received by the TLDs while in transit from the reported values.

[c]Duplicate sample.

Table A-14. Direct Gamma Radiation Data for Monticello, Fourth Quarter 1994

Report Number	Report Date	Date Installed	Date Removed	Days Exposed
8052-15	01/24/1995	10/04/1994	12/29/1994	86

TLD ID	Field Location	Reported Value[a] for Quarter (mrem)	Corrected Value[b] Daily Exposure (mrem)	Approximate Annual Exposure (mrem)
GJ-22	R-M-1-TLD	27.1	0.3	115
GJ-38	R-M-1-TLD[c]	22.6	0.3	96
GJ-21	R-M-2-TLD	25.7	0.3	109
GJ-39	R-M-2-TLD[c]	20.5	0.2	87
GJ-17	R-M-3-TLD	27.3	0.3	116
GJ-18	R-M-3-TLD[c]	28.4	0.3	121
GJ-3	R-M-4-TLD	28.0	0.3	119
GJ-12	R-M-4-TLD[c]	22.9	0.3	97
GJ-13	R-M-5-TLD	25.4	0.3	108
GJ-15	R-M-5-TLD[c]	24.1	0.3	102
GJ-5	R-M-6-TLD	25.4	0.3	108
GJ-33	R-M-6-TLD[c]	24.4	0.3	104
GJ-19	R-M-7-TLD	20.3	0.2	86
GJ-36	R-M-7-TLD[c]	20.4	0.2	87
GJ-1	TLD-M-02	22.2	0.3	94
GJ-8	TLD-M-02[c]	22.9	0.3	97
GJ-28	TLD-M-03	23.0	0.3	98
GJ-37	TLD-M-03[c]	21.6	0.3	92
GJ-4	TLD-M-04	27.6	0.3	117
GJ-7	TLD-M-04[c]	28.5	0.3	121
GJ-23	TLD-M-05	94.3	1.1	400
GJ-24	TLD-M-05[c]	98.8	1.1	419
GJ-2	TLD-M-06	62.0	0.7	263
GJ-14	TLD-M-06[c]	68.8	0.8	292
GJ-6	TLD-M-07	28.5	0.3	121
GJ-26	TLD-M-07[c]	33.7	0.4	143
GJ-10	TLD-M-08	24.1	0.3	102
GJ-11	TLD-M-08[c]	21.7	0.3	92
GJ-9	TLD-M-09	26.3	0.3	112
GJ-20	TLD-M-09[c]	27.4	0.3	116
GJ-25	TLD-M-10	28.7	0.3	122
GJ-40	TLD-M-10[c]	27.0	0.3	115
GJ-31	TLD-M-11	48.1	0.6	204
GJ-35	TLD-M-11[c]	52.0	0.6	221
GJ-16	TLD-M-12	103.3	1.2	438
GJ-27	TLD-M-12[c]	120.0	1.4	509
GJ-29	TLD-M-13	24.0	0.3	102
GJ-30	TLD-M-13[c]	26.2	0.3	111

[a]The reported values are the results received from the subcontracted laboratory.

[b]The corrected values are derived by subtracting the exposure received by the TLDs while in transit from the reported values.

[c]Duplicate sample.

Table A-15. Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ag (µg/L)	Ag[b] (µg/L)	Al (µg/L)	Al[b] (µg/L)	Alkalinity (as $CaCO_3$) (ppm)	Alpha (pCi/L)[c]	As (µg/L)	As[b] (µg/L)	B (µg/L)
Carbonate Seep	NBD-538	05/04/1994	<4.0	No Data	~55.1	No Data	236	1300	349	No Data	204
	NBD-666	10/11/1994	<1.0	<1.0	1930	<10.0	353	2360	180	193	124
	NBD-667	10/11/1994	<1.0	<1.0	316	<10.0	No Data	2130	182	194	130
Montezuma Canyon	NBD-526	05/02/1994	<4.0	No Data	359	No Data	171	115	~4.8	No Data	~79.8
	NBD-661	10/07/1994	<1.0	<1.0	~91.2	<10.0	259	64	~4.9	~4.2	~94.6
North Drainage	NBD-537	05/04/1994	<4.0	No Data	831	No Data	263	42	~2.6	No Data	~89.0
PEHRSON 1	NBD-546	05/06/1994	<4.0	No Data	~158	No Data	416	<23	10.6	No Data	~55.3
	NBD-662	10/10/1994	<1.0	<1.0	1320	<10.0	531	<35	~7.9	~5.8	~83.1
PEHRSON 2	NBD-547	05/06/1994	<4.0	No Data	1450	No Data	673	<55	11.0	No Data	110
SW92-01	NBD-529	05/03/1994	<4.0	No Data	~112	No Data	215	<41	<2.0	No Data	~47.2
	NBD-651	10/05/1994	<1.0	<1.0	~82.7	<10.0	130	<40	<2.0	<2.0	~46.4
SW92-02	NBD-527	05/02/1994	<4.0	No Data	~126	No Data	245	<18.1	<2.0	No Data	~31.6
	NBD-652	10/05/1994	<1.0	<1.0	361	<10.0	155	<9.4	~2.3	<2.0	~21.2
SW92-03	NBD-528	05/02/1994	<4.0	No Data	394	No Data	220	<25	<2.0	No Data	~37.4
	NBD-653	10/05/1994	<1.0	<1.0	~149	<10.0	123	<22	<2.0	<2.0	~35.4
SW92-04	NBD-540	05/04/1994	<4.0	No Data	~155	No Data	249	<33	<2.0	No Data	~54.2
	NBD-663	10/11/1994	<1.0	<1.0	215	<10.0	262	140	11.3	15.6	~52.5
SW92-05	NBD-542	05/05/1994	<4.0	No Data	~124	No Data	246	<31	~2.5	No Data	~52.8
	NBD-543	05/05/1994	<4.0	No Data	~62.9	No Data	246	47	~4.9	No Data	~50.4
	NBD-664	10/11/1994	<1.0	<1.0	409	<10.0	285	<51	11.4	13.8	~55.7
SW92-06	NBD-535	05/04/1994	<4.0	No Data	281	No Data	262	98	~3.0	No Data	~57.8
	NBD-536	05/04/1994	<4.0	No Data	217	No Data	No Data	190	<2.0	No Data	~55.6
	NBD-658	10/06/1994	<1.0	<1.0	~175	<10.0	313	155	~6.6	~8.5	~75.4
SW92-07	NBD-531	05/03/1994	<4.0	No Data	~185	No Data	239	124	<2.0	No Data	~65.4
	NBD-654	10/05/1994	<1.0	<1.0	292	<10.0	200	149	<2.0	~2.8	~83.3
SW92-08	NBD-532	05/03/1994	<4.0	No Data	~128	No Data	237	264	~4.6	No Data	~76.1
	NBD-659	10/06/1994	<1.0	<1.0	~17.4	<10.0	237	129	~2.5	~3.6	~79.3
SW92-09	NBD-533	05/03/1994	<4.0	No Data	389	No Data	253	103	<2.0	No Data	~77.8
	NBD-660	10/06/1994	<1.0	<1.0	~13.3	<10.0	227	159	<2.0	~3.5	~75.8
Sorenson	NBD-530	05/03/1994	<4.0	No Data	293	No Data	253	145	<2.0	No Data	~68.8
	NBD-657	10/06/1994	<1.0	<1.0	~44.9	<10.0	287	252	<2.0	~3.2	~83.5

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ag (μg/L)	Ag[b] (μg/L)	Al (μg/L)	Al[b] (μg/L)	Alkalinity (as $CaCO_3$) (ppm)	Alpha (pCi/L)[c]	As (μg/L)	As[b] (μg/L)	B (μg/L)
Upper North Drainage	NBD-545	05/06/1994	<4.0	No Data	315	No Data	1562	<61	~2.4	No Data	~48.4
	NBD-670	10/12/1994	<1.0	<1.0	298	<10.0	280	<69	~4.4	~3.7	~67.4
W-2	NBD-539	05/04/1994	<4.0	No Data	492	No Data	548	1560	1250	No Data	403
	NBD-668	10/11/1994	<1.0	<1.0	987	~29.5	516	2480	876	921	244
W-4	NBD-534	05/03/1994	<4.0	No Data	275	No Data	231	82	~4.4	No Data	~59.3
	NBD-655	10/06/1994	<1.0	<1.0	~137	<10.0	283	75	10.2	16.0	~63.1
	NBD-656	10/06/1994	<1.0	<1.0	~171	<10.0	No Data	92	12.4	14.7	~58.1

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued) Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	B[b] (µg/L)	Ba (µg/L)	Ba[b] (µg/L)	Beta (pCi/L)[c]	Ca[d] (mg/L)	Cd (µg/L)	Cd[b] (µg/L)	CDT[e] (µmhos/cm)	Cl[d] (mg/L)
Carbonate Seep	NBD-538	05/04/1994	No Data	~22.5	No Data	522	97.0	<1.0	No Data	1629	48.5
	NBD-666	10/11/1994	114	~123	~105	1288	193	<1.0	<1.0	1578	42.1
	NBD-667	10/11/1994	116	~103	~106	1180	188	<1.0	<1.0	No Data	41.9
Montezuma Canyon	NBD-526	05/02/1994	No Data	~50.0	No Data	27.5	196	<1.0	No Data	1750	68.6
	NBD-661	10/07/1994	~88.9	~126	~132	<35	183	<1.0	<1.0	1988	96.9
North Drainage	NBD-537	05/04/1994	No Data	~77.5	No Data	<47	140	<1.0	No Data	1021	65.9
PEHRSON 1	NBD-546	05/06/1994	No Data	~76.3	No Data	<13.6	137	<1.0	No Data	1175	38.7
	NBD-662	10/10/1994	~89.9	~147	~110	<20	152	<1.0	<1.0	1270	74.7
PEHRSON 2	NBD-547	05/06/1994	No Data	~141	No Data	<64	154	<1.0	No Data	1481	66.1
SW92-01	NBD-529	05/03/1994	No Data	~24.7	No Data	<21	388	<1.0	No Data	1935	10.8
	NBD-651	10/05/1994	~39.1	~29.0	~30.3	<35	347	<1.0	<1.0	1733	4.62
SW92-02	NBD-527	05/02/1994	No Data	~85.8	No Data	<19.2	104	<1.0	No Data	711	10.0
	NBD-652	10/05/1994	~17.8	~92.6	~89.8	<7.1	63.3	<1.0	<1.0	472	4.29
SW92-03	NBD-528	05/02/1994	No Data	~67.5	No Data	<14.6	200	<1.0	No Data	1151	8.3
	NBD-653	10/05/1994	~24.1	~72.4	~74.5	<17.7	203	<1.0	<1.0	1192	4.76
SW92-04	NBD-540	05/04/1994	No Data	~42.1	No Data	<32	266	<1.0	No Data	1598	12.5
	NBD-663	10/11/1994	~46.7	~69.4	~69.8	48	338	<1.0	<1.0	1854	12.1
SW92-05	NBD-542	05/05/1994	No Data	~40.3	No Data	<32	269	<1.0	No Data	1609	13.5
	NBD-543	05/05/1994	No Data	~40.4	No Data	<32	273	<1.0	No Data	1609	13.4
	NBD-664	10/11/1994	~48.7	~74.8	~68.4	<40	338	<1.0	<1.0	1871	12.3
SW92-06	NBD-535	05/04/1994	No Data	~36.9	No Data	37	273	<1.0	No Data	1675	22.5
	NBD-536	05/04/1994	No Data	~35.8	No Data	43	278	<1.0	No Data	No Data	22.8
	NBD-658	10/06/1994	~74.5	~109	~109	104	281	<1.0	<1.0	1930	33.1
SW92-07	NBD-531	05/03/1994	No Data	~36.1	No Data	33	254	<1.0	No Data	1817	35.6
	NBD-654	10/05/1994	~67.1	~96.4	~95.8	83	205	<1.0	<1.0	1648	49
SW92-08	NBD-532	05/03/1994	No Data	~45.8	No Data	70	244	<1.0	No Data	1703	36.4
	NBD-659	10/06/1994	~60.9	~76.1	~77.2	70.1	173	<1.0	<1.0	1496	45.4
SW92-09	NBD-533	05/03/1994	No Data	~47.6	No Data	40	235	<1.0	No Data	1697	38.5
	NBD-660	10/06/1994	~64.1	~75.7	~73.7	76.5	177	<1.0	<1.0	1466	46.5
Sorenson	NBD-530	05/03/1994	No Data	~36.4	No Data	43	272	<1.0	No Data	1829	34.1
	NBD-657	10/06/1994	~76.1	~97.0	~101	118	260	<1.0	<1.0	2030	49.9

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[d]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[e]Conductivity in micromhos per centimeter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	B[b] (µg/L)	Ba (µg/L)	Ba[b] (µg/L)	Beta (pCi/L)[c]	Ca[d] (mg/L)	Cd (µg/L)	Cd[b] (µg/L)	CDT[e] (µmhos/cm)	Cl[d] (mg/L)
Upper North Drainage	NBD-545	05/06/1994	No Data	~136	No Data	<64	103	<1.0	No Data	1498	316
	NBD-670	10/12/1994	~66.0	290	260	<41	133	<1.0	<1.0	3620	823
W-2	NBD-539	05/04/1994	No Data	~29.0	No Data	510	52.7	<1.0	No Data	5170	452
	NBD-668	10/11/1994	236	~79.9	~87.4	1217	149	<1.0	<1.0	3810	283
W-4	NBD-534	05/03/1994	No Data	~41.4	No Data	<20	272	<1.0	No Data	1640	17.5
	NBD-655	10/06/1994	~52.9	~82.5	~81.2	79	322	<1.0	<1.0	1832	21.2
	NBD-656	10/06/1994	~51.4	~80.4	~78.2	75	294	<1.0	<1.0	No Data	21

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[d]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[e]Conductivity in micromhos per centimeter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Cr (μg/L)	Cr[b] (μg/L)	Cu (μg/L)	Cu[b] (μg/L)	F (μg/L)	Fe (μg/L)	Fe[b] (μg/L)	K[c] (mg/L)	Mg[c] (mg/L)
Carbonate Seep	NBD-538	05/04/1994	<4.0	No Data	~3.5	No Data	518	~52.1	No Data	24.6	39.7
	NBD-666	10/11/1994	~2.1	<2.0	66.2	~6.6	343	1190	<6.0	17.2	35.7
	NBD-667	10/11/1994	<2.0	<2.0	~18.5	~9.8	348	176	<6.0	15.6	34.4
Montezuma Canyon	NBD-526	05/02/1994	26.3	No Data	~3.7	No Data	~144	581	No Data	5.2	54.5
	NBD-661	10/07/1994	<2.0	<2.0	<4.0	<4.0	~116	224	<6.0	6.15	56.2
North Drainage	NBD-537	05/04/1994	<4.0	No Data	<2.0	No Data	~178	856	No Data	~4.2	31.2
PEHRSON 1	NBD-546	05/06/1994	<4.0	No Data	<2.0	No Data	312	1670	No Data	<0.74	26.4
	NBD-662	10/10/1994	<2.0	<2.0	~16.3	<4.0	346	2060	~7.4	<.672	36.7
PEHRSON 2	NBD-547	05/06/1994	<4.0	No Data	<2.0	No Data	364	1550	No Data	8.6	50.0
SW92-01	NBD-529	05/03/1994	<4.0	No Data	<2.0	No Data	~115	265	No Data	~2.8	50.3
	NBD-651	10/05/1994	<2.0	<2.0	<4.0	<4.0	~123	150	<6.0	~2.89	41.1
SW92-02	NBD-527	05/02/1994	<4.0	No Data	<2.0	No Data	~136	132	No Data	~0.85	16.0
	NBD-652	10/05/1994	<2.0	<2.0	<4.0	<4.0	~156	375	<6.0	<.672	10.5
SW92-03	NBD-528	05/02/1994	<4.0	No Data	<2.0	No Data	~122	430	No Data	~2.7	29.1
	NBD-653	10/05/1994	<2.0	<2.0	<4.0	<4.0	~127	153	<6.0	~1.93	27
SW92-04	NBD-540	05/04/1994	<4.0	No Data	<2.0	No Data	~103	269	No Data	~2.2	44.5
	NBD-663	10/11/1994	<2.0	<2.0	<4.0	<4.0	~75.6	251	<6.0	~3.62	51.8
SW92-05	NBD-542	05/05/1994	<4.0	No Data	<2.0	No Data	~96.6	178	No Data	~2.2	44.4
	NBD-543	05/05/1994	<4.0	No Data	<2.0	No Data	~88.6	128	No Data	~2.4	44.9
	NBD-664	10/11/1994	<2.0	<2.0	<4.0	<4.0	~95.9	450	<6.0	~3.45	51.9
SW92-06	NBD-535	05/04/1994	<4.0	No Data	~4.5	No Data	~92.2	337	No Data	~3.3	47.6
	NBD-536	05/04/1994	<4.0	No Data	<2.0	No Data	~103	295	No Data	~2.8	48.0
	NBD-658	10/06/1994	<2.0	<2.0	<4.0	<4.0	~93.5	217	<6.0	6.21	53.1
SW92-07	NBD-531	05/03/1994	<4.0	No Data	<2.0	No Data	~105	433	No Data	~4.1	51.4
	NBD-654	10/05/1994	<2.0	<2.0	<4.0	<4.0	~149	391	<6.0	5.83	46.1
SW92-08	NBD-532	05/03/1994	<4.0	No Data	<2.0	No Data	~124	367	No Data	~4.4	50.8
	NBD-659	10/06/1994	<2.0	<2.0	<4.0	<4.0	~140	~90.8	<6.0	~4.92	40.2
SW92-09	NBD-533	05/03/1994	<4.0	No Data	<2.0	No Data	~110	427	No Data	~4.1	48.9
	NBD-660	10/06/1994	<2.0	<2.0	<4.0	<4.0	~146	~82.6	<6.0	5.6	41.2
Sorenson	NBD-530	05/03/1994	<4.0	No Data	<2.0	No Data	~103	524	No Data	~3.9	51.2
	NBD-657	10/06/1994	<2.0	<2.0	<4.0	<4.0	~80.5	150	<6.0	6.39	55.8

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Cr (µg/L)	Cr[b] (µg/L)	Cu (µg/L)	Cu[b] (µg/L)	F (µg/L)	Fe (µg/L)	Fe[b] (µg/L)	K[c] (mg/L)	Mg[c] (mg/L)
Upper North Drainage	NBD-545	05/06/1994	<4.0	No Data	<2.0	No Data	~164	370	No Data	9.8	18.1
	NBD-670	10/12/1994	<2.0	<2.0	<4.0	<4.0	~129	300	~17.4	23.7	25.1
W-2	NBD-539	05/04/1994	<4.0	No Data	65.1	No Data	1070	448	No Data	62.1	42.8
	NBD-668	10/11/1994	<2.0	~2.4	49.0	~21.7	<51.0	475	<6.0	44	41.6
W-4	NBD-534	05/03/1994	<4.0	No Data	<2.0	No Data	~105	320	No Data	~3.0	46.0
	NBD-655	10/06/1994	<2.0	<2.0	<4.0	<4.0	~98.7	154	<6.0	~4.47	51.7
	NBD-656	10/06/1994	<2.0	<2.0	<4.0	<4.0	~90.6	190	<6.0	~4.75	50.6

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Mn (µg/L)	Mn[b] (µg/L)	Mo (µg/L)	Mo[b] (µg/L)	Na[c] (mg/L)	NH_4 (µg/L)	Ni (µg/L)	Ni[b] (µg/L)	NO_3+NO_2-N[d] (µg/L)
Carbonate Seep	NBD-538	05/04/1994	25.4	No Data	133	No Data	202	58.8	<6.0	No Data	~28.3
	NBD-666	10/11/1994	632	500	56.4	89.8	104	95.8	<8.0	<8.0	~107
	NBD-667	10/11/1994	475	460	~40.8	~39.1	99.2	189	<8.0	<8.0	~57.8
Montezuma Canyon	NBD-526	05/02/1994	307	No Data	<27.0	No Data	128	53.1	~6.8	No Data	~18.5
	NBD-661	10/07/1994	374	382	~14.3	~15.2	166	248	<8.0	<8.0	~60.6
North Drainage	NBD-537	05/04/1994	36.7	No Data	<27.0	No Data	59.6	112	<6.0	No Data	~61.8
PEHRSON 1	NBD-546	05/06/1994	1000	No Data	<27.0	No Data	60.6	64.6	<6.0	No Data	187
	NBD-662	10/10/1994	286	69.8	<1.0	<1.0	94.6	202	<8.0	<8.0	~108
PEHRSON 2	NBD-547	05/06/1994	561	No Data	<27.0	No Data	190	3990	<6.0	No Data	~74.4
SW92-01	NBD-529	05/03/1994	114	No Data	<27.0	No Data	26.9	61.7	<6.0	No Data	146
	NBD-651	10/05/1994	119	117	~2.4	~3.2	22.4	66.5	<8.0	<8.0	~90.4
SW92-02	NBD-527	05/02/1994	23.0	No Data	<27.0	No Data	24.6	50.2	<6.0	No Data	~41.0
	NBD-652	10/05/1994	17.6	~3.0	<1.0	~1.7	17.1	175	<8.0	<8.0	~75.5
SW92-03	NBD-528	05/02/1994	37.4	No Data	<27.0	No Data	25.8	96.3	<6.0	No Data	~21.8
	NBD-653	10/05/1994	~11.2	~7.5	~1.8	~2.4	19.3	160	<8.0	<8.0	~84.1
SW92-04	NBD-540	05/04/1994	111	No Data	<27.0	No Data	41.0	50.2	<6.0	No Data	733
	NBD-663	10/11/1994	463	452	~27.0	~24.7	51	49.0	<8.0	<8.0	~367
SW92-05	NBD-542	05/05/1994	123	No Data	<27.0	No Data	41.8	64.6	<6.0	No Data	827
	NBD-543	05/05/1994	124	No Data	<27.0	No Data	43.0	61.7	<6.0	No Data	902
	NBD-664	10/11/1994	484	459	~27.8	~25.8	51.5	51.9	<8.0	<8.0	~446
SW92-06	NBD-535	05/04/1994	217	No Data	<27.0	No Data	62.6	102	<6.0	No Data	939
	NBD-536	05/04/1994	218	No Data	<27.0	No Data	61.3	111	<6.0	No Data	882
	NBD-658	10/06/1994	616	601	~46.7	~45.0	94.5	84.1	<8.0	<8.0	~260
SW92-07	NBD-531	05/03/1994	302	No Data	<27.0	No Data	82.4	76.1	<6.0	No Data	677
	NBD-654	10/05/1994	358	352	~35.9	~34.4	105	69.5	<8.0	<8.0	~156
SW92-08	NBD-532	05/03/1994	334	No Data	~31.0	No Data	86.1	128	<6.0	No Data	381
	NBD-659	10/06/1994	98.4	97.0	~28.8	~28.0	94.7	68.8	<8.0	<8.0	~67.1
SW92-09	NBD-533	05/03/1994	291	No Data	<27.0	No Data	85.8	145	<6.0	No Data	328
	NBD-660	10/06/1994	53.8	49.4	~28.1	~26.9	98.2	499	<8.0	<8.0	~58.5
Sorenson	NBD-530	05/03/1994	283	No Data	<27.0	No Data	75.8	90.6	<6.0	No Data	848
	NBD-657	10/06/1994	439	460	~45.4	~45.9	114	75.3	<8.0	<8.0	~223

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d](Nitrate + nitrite) as nitrogen. The samples were acidified in the field, thus the nitrite was oxidized to nitrate.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Mn (µg/L)	Mn[b] (µg/L)	Mo (µg/L)	Mo[b] (µg/L)	Na[c] (mg/L)	NH_4 (µg/L)	Ni (µg/L)	Ni[b] (µg/L)	NO_3+NO_2-N[d] (µg/L)
Upper North Drainage	NBD-545	05/06/1994	119	No Data	<27.0	No Data	203	370	<6.0	No Data	1230
	NBD-670	10/12/1994	34.7	26.6	~4.4	~3.4	438	1890	<8.0	<8.0	2430
W-2	NBD-539	05/04/1994	43.0	No Data	2450	No Data	1060	258	<6.0	No Data	5950
	NBD-668	10/11/1994	199	144	~1460	~1490	659	254	<8.0	<8.0	7290
W-4	NBD-534	05/03/1994	128	No Data	<27.0	No Data	52.8	114	<6.0	No Data	943
	NBD-655	10/06/1994	472	467	~36.6	~38.1	66.9	107	<8.0	<8.0	~468
	NBD-656	10/06/1994	466	453	~36.5	~34.8	65.4	119	<8.0	<8.0	~486

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d](Nitrate + nitrite) as nitrogen. The samples were acidified in the field, thus the nitrite was oxidized to nitrate.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Pb (µg/L)	Pb[b] (µg/L)	Pb-210 (pCi/L)[c]	pH	Po-210 (pCi/L)[c]	Ra-226 (pCi/L)[c]	Ra-228 (pCi/L)[c]	Rn-222 (pCi/L)[c]	Se (µg/L)
Carbonate Seep	NBD-538	05/04/1994	<1.0	No Data	17.5	8.5	<0.16	4.56	<5.5	3189	29.2
	NBD-666	10/11/1994	5.9	<1.0	8.4	8.00	1.24	26.30	<9.6	18767	16.5
	NBD-667	10/11/1994	<1.0	<1.0	9.5	No Data	1.24	19.69	<5.5	21579	16.2
Montezuma Canyon	NBD-526	05/02/1994	<1.0	No Data	<2	8.54	<0.11	0.28	<3.2	<75	~2.7
	NBD-661	10/07/1994	<1.0	<1.0	<2	8.14	<0.5	<0.5	<2.5	80	<2.0
North Drainage	NBD-537	05/04/1994	~1.4	No Data	<2	8.55	<0.15	4.10	<3.9	63	~2.5
PEHRSON 1	NBD-546	05/06/1994	<1.0	No Data	<2	7.21	<0.15	0.51	<1.7	384	~1.9
	NBD-662	10/10/1994	~2.2	<1.0	<2	7.59	<0.5	<0.5	<3.1	<87	<2.0
PEHRSON 2	NBD-547	05/06/1994	~1.8	No Data	<2	7.51	<0.14	2.35	<1.8	337	~2.9
SW92-01	NBD-529	05/03/1994	<1.0	No Data	<2	8.24	<0.09	<0.15	<3.8	<67	~3.0
	NBD-651	10/05/1994	<1.0	<1.0	<2	7.96	<0.5	<0.5	<7.1	<55	<2.0
SW92-02	NBD-527	05/02/1994	<1.0	No Data	<2	8.0	0.14	<0.12	<2.6	164	~1.9
	NBD-652	10/05/1994	<1.0	<1.0	<2	8.25	<0.5	<0.5	<2.9	<54	<2.0
SW92-03	NBD-528	05/02/1994	<1.0	No Data	<2	8.17	0.19	0.13	<1.7	<75	~1.8
	NBD-653	10/05/1994	<1.0	<1.0	<2	8.24	<0.5	<0.5	<2.3	<54	<2.0
SW92-04	NBD-540	05/04/1994	<1.0	No Data	<2	8.06	<0.13	0.36	<1.8	253	~4.1
	NBD-663	10/11/1994	<1.0	<1.0	<2	7.73	<0.5	0.96	<2.3	411	8.5
SW92-05	NBD-542	05/05/1994	<1.0	No Data	<2	8.06	<0.14	0.16	<2.2	178	~4.6
	NBD-543	05/05/1994	<1.0	No Data	<2	8.06	<0.18	0.24	<2.4	149	~4.1
	NBD-664	10/11/1994	<1.0	<1.0	<2	7.99	<0.5	0.90	<3.4	207	9.0
SW92-06	NBD-535	05/04/1994	<1.0	No Data	<2	8.26	<0.09	0.30	<2.4	<58	5.2
	NBD-536	05/04/1994	<1.0	No Data	<2	No Data	0.30	0.42	<1.4	<58	5.3
	NBD-658	10/06/1994	<1.0	<1.0	3.59	9.6	<0.5	0.90	<3.0	282	8.5
SW92-07	NBD-531	05/03/1994	<1.0	No Data	<2	8.38	<0.11	0.86	<1.8	453	~4.6
	NBD-654	10/05/1994	<1.0	<1.0	3.92	8.11	<0.5	1.12	<2.6	283	~4.3
SW92-08	NBD-532	05/03/1994	<1.0	No Data	<2	8.3	<0.12	1.04	<3.3	128	~3.7
	NBD-659	10/06/1994	<1.0	<1.0	<2	8.24	<0.5	1.27	<3.2	79	~2.1
SW92-09	NBD-533	05/03/1994	<1.0	No Data	<2	8.23	<0.10	0.94	<1.9	185	~4.1
	NBD-660	10/06/1994	~1.2	<1.0	<2	8.46	<0.5	0.56	<1.4	<50	~2.5
Sorenson	NBD-530	05/03/1994	<1.0	No Data	<2	7.82	<0.09	0.71	<2.0	126	~4.7
	NBD-657	10/06/1994	<1.0	<1.0	6.58	7.93	<0.5	0.83	<1.4	194	5.9

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

[e]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Pb (μg/L)	Pb[b] (μg/L)	Pb-210 (pCi/L)[c]	pH	Po-210 (pCi/L)[c]	Ra-226 (pCi/L)[c]	Ra-228 (pCi/L)[c]	Rn-222 (pCi/L)[c]	Se (μg/L)
Upper North Drainage	NBD-545	05/06/1994	<1.0	No Data	<2	7.93	<0.14	<0.45	<2.7	<46	~2.3
	NBD-670	10/12/1994	<1.0	<1.0	<2	7.99	<0.5	3.10	<6.6	<66	<2.0
W-2	NBD-539	05/04/1994	<1.0	No Data	22.3	9.46	<0.12	6.56	<5.2	4624	540
	NBD-668	10/11/1994	3.6	<1.0	11.3	8.31	1.33	29.96	<10.1	43748	496
W-4	NBD-534	05/03/1994	<1.0	No Data	<2	8.0	<0.15	0.34	<1.9	<65	~4.7
	NBD-655	10/06/1994	<1.0	<1.0	<2	7.89	<0.5	0.75	<2.0	92	9.8
	NBD-656	10/06/1994	<1.0	<1.0	2.02	No Data	<0.5	0.97	<1.7	98	9.4

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

[e]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Se[b] (µg/L)	SO_4[c] (mg/L)	TDS[d] (mg/L)	Temperature (degrees C)	Th-230 (pCi/L)[e]	Th-232 (pCi/L)[e]	Tl (µg/L)	Tl[b] (µg/L)	U (µg/L)
Carbonate Seep	NBD-538	05/04/1994	No Data	555	1190	21.2	<1.29	<1.07	<1.0	No Data	2210
	NBD-666	10/11/1994	21.0	476	1130	15.2	0.33	<0.3	<1.0	<1.0	2720
	NBD-667	10/11/1994	19.5	472	1140	No Data	0.54	<0.3	<1.0	<1.0	2600
Montezuma Canyon	NBD-526	05/02/1994	No Data	637	1340	17.9	<0.28	<0.33	<1.0	No Data	116
	NBD-661	10/07/1994	<2.0	680	1460	7.2	0.77	0.64	<1.0	<1.0	100
North Drainage	NBD-537	05/04/1994	No Data	222	734	17.3	<0.05	<0.05	<1.0	No Data	56.6
PEHRSON 1	NBD-546	05/06/1994	No Data	68.1	646	9.1	<0.12	<0.08	<1.0	No Data	5.3
	NBD-662	10/10/1994	<2.0	65.5	810	20.6	<0.3	<0.3	<1.0	<1.0	~3.0
PEHRSON 2	NBD-547	05/06/1994	No Data	118	1150	18.4	<0.07	<0.04	<1.0	No Data	37.3
SW92-01	NBD-529	05/03/1994	No Data	927	1720	6.8	<0.17	<0.17	<1.0	No Data	~4.5
	NBD-651	10/05/1994	<2.0	816	1460	9.5	<0.3	<0.3	<1.0	<1.0	~3.5
SW92-02	NBD-527	05/02/1994	No Data	151	~474	10.8	<0.15	<0.17	<1.0	No Data	~2.4
	NBD-652	10/05/1994	<2.0	57.8	~306	8.8	0.58	0.40	<1.0	<1.0	<1.0
SW92-03	NBD-528	05/02/1994	No Data	435	898	15.2	<0.18	<0.17	<1.0	No Data	~3.0
	NBD-653	10/05/1994	<2.0	474	914	9.8	1.23	0.76	<1.0	<1.0	~2.4
SW92-04	NBD-540	05/04/1994	No Data	649	1280	15.5	<0.07	<0.06	<1.0	No Data	44.1
	NBD-663	10/11/1994	10.9	830	1530	8.5	<0.3	<0.3	~1.0	<1.0	94.9
SW92-05	NBD-542	05/05/1994	No Data	638	1290	9.8	<0.13	<0.15	<1.0	No Data	48.0
	NBD-543	05/05/1994	No Data	640	1270	9.8	<0.12	<0.12	<1.0	No Data	49.1
	NBD-664	10/11/1994	10.3	831	1540	6.5	<0.3	<0.3	<1.0	<1.0	97.0
SW92-06	NBD-535	05/04/1994	No Data	662	1340	8.6	<0.25	<0.21	<1.0	No Data	122
	NBD-536	05/04/1994	No Data	665	1360	No Data	<0.09	<0.06	<1.0	No Data	120
	NBD-658	10/06/1994	9.8	800	1530	8.8	0.55	<0.3	<1.0	<1.0	231
SW92-07	NBD-531	05/03/1994	No Data	688	1380	10.1	<0.25	<0.19	<1.0	No Data	159
	NBD-654	10/05/1994	5.1	599	1250	11.4	0.53	0.31	<1.0	<1.0	234
SW92-08	NBD-532	05/03/1994	No Data	647	1340	13.2	<0.15	<0.12	<1.0	No Data	152
	NBD-659	10/06/1994	~3.7	517	1110	10.2	0.60	0.44	<1.0	<1.0	180
SW92-09	NBD-533	05/03/1994	No Data	644	1310	13.0	<0.20	<0.24	<1.0	No Data	150
	NBD-660	10/06/1994	~3.8	508	1070	13	0.46	<0.3	~1.2	<1.0	177
Sorenson	NBD-530	05/03/1994	No Data	703	1440	8.8	<0.92	<0.58	<1.0	No Data	162
	NBD-657	10/06/1994	6.5	802	1610	8.7	0.49	<0.3	<1.0	<1.0	287

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

[e]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Se[b] (μg/L)	SO_4[c] (mg/L)	TDS[d] (mg/L)	Temperature (degrees C)	Th-230 (pCi/L)[e]	Th-232 (pCi/L)[e]	Tl (μg/L)	Tl[b] (μg/L)	U (μg/L)
Upper North Drainage	NBD-545	05/06/1994	No Data	25.6	1020	7.2	<0.13	<0.10	<1.0	No Data	19.5
	NBD-670	10/12/1994	<2.0	41.2	1900	8.8	0.36	<0.3	<1.0	<1.0	37.7
W-2	NBD-539	05/04/1994	No Data	1380	3690	19.9	<0.33	<0.23	<1.0	No Data	1930
	NBD-668	10/11/1994	504	1010	2680	No Data	0.44	<0.3	<1.0	<1.0	2610
W-4	NBD-534	05/03/1994	No Data	656	1310	12.2	<0.68	<0.44	<1.0	No Data	85.5
	NBD-655	10/06/1994	10.9	803	1520	6.8	0.37	<0.3	<1.0	<1.0	159
	NBD-656	10/06/1994	11.5	794	1550	No Data	<0.3	<0.3	<1.0	<1.0	155

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

[e]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	U[b] (μg/L)	U-234 (pCi/L)[c]	U-235 (pCi/L)[c]	U-238 (pCi/L)[c]	V (μg/L)	V[b] (μg/L)	Zn (μg/L)	Zn[b] (μg/L)
Carbonate Seep	NBD-538	05/04/1994	No Data	755.25	30.24	785.93	6010	No Data	~9.2	No Data
	NBD-666	10/11/1994	2610	824.37	35.73	850.83	6230	6170	39.2	<2.0
	NBD-667	10/11/1994	2570	830.54	39.49	837.47	5950	6120	~4.7	<2.0
Montezuma Canyon	NBD-526	05/02/1994	No Data	40.71	1.49	39.65	~6.6	No Data	~13.9	No Data
	NBD-661	10/07/1994	103	37.60	1.94	38.11	<6.0	<6.0	~4.9	<2.0
North Drainage	NBD-537	05/04/1994	No Data	19.67	0.88	19.43	~42.0	No Data	~10.4	No Data
PEHRSON 1	NBD-546	05/06/1994	No Data	6.43	<0.27	4.16	<5.0	No Data	~6.9	No Data
	NBD-662	10/10/1994	~3.4	2.02	<0.3	1.17	<6.0	<6.0	24.9	<2.0
PEHRSON 2	NBD-547	05/06/1994	No Data	14.83	<0.22	13.02	~19.7	No Data	~15.8	No Data
SW92-01	NBD-529	05/03/1994	No Data	3.96	<0.07	1.60	<5.0	No Data	~11.3	No Data
	NBD-651	10/05/1994	~3.6	2.91	<0.3	1.18	<6.0	<6.0	~8.8	<2.0
SW92-02	NBD-527	05/02/1994	No Data	2.26	<0.13	1.14	<5.0	No Data	20.5	No Data
	NBD-652	10/05/1994	~1.1	0.81	<0.3	0.43	<6.0	<6.0	~7.5	<2.0
SW92-03	NBD-528	05/02/1994	No Data	2.35	<0.05	1.09	<5.0	No Data	~11.6	No Data
	NBD-653	10/05/1994	~2.3	2.40	0.53	1.07	<6.0	<6.0	~11.8	<2.0
SW92-04	NBD-540	05/04/1994	No Data	16.38	1.77	14.44	92.9	No Data	~5.2	No Data
	NBD-663	10/11/1994	90.1	33.67	1.45	32.78	450	442	~3.1	<2.0
SW92-05	NBD-542	05/05/1994	No Data	17.95	0.95	16.38	112	No Data	~3.1	No Data
	NBD-543	05/05/1994	No Data	19.17	0.68	17.64	109	No Data	~5.6	No Data
	NBD-664	10/11/1994	93.1	33.27	1.56	31.07	400	382	<2.0	<2.0
SW92-06	NBD-535	05/04/1994	No Data	41.76	<0.49	41.04	93.4	No Data	~17.7	No Data
	NBD-536	05/04/1994	No Data	45.29	<1.91	43.43	97.4	No Data	~6.2	No Data
	NBD-658	10/06/1994	226	81.20	3.16	76.20	272	263	~3.0	<2.0
SW92-07	NBD-531	05/03/1994	No Data	54.15	3.20	52.35	59.4	No Data	~5.2	No Data
	NBD-654	10/05/1994	230	83.15	3.15	78.63	~50.0	~42.7	~2.4	<2.0
SW92-08	NBD-532	05/03/1994	No Data	53.02	<1.72	51.43	~39.8	No Data	~9.6	No Data
	NBD-659	10/06/1994	182	65.57	2.29	66.78	~28.9	~27.6	<2.0	<2.0
SW92-09	NBD-533	05/03/1994	No Data	51.25	2.56	52.08	~31.8	No Data	~11.8	No Data
	NBD-660	10/06/1994	171	62.32	3.24	59.18	~28.4	~30.5	<2.0	<2.0
Sorenson	NBD-530	05/03/1994	No Data	57.30	<0.97	54.34	72.7	No Data	~9.5	No Data
	NBD-657	10/06/1994	291	106.48	3.89	98.34	80.3	74.7	<2.0	<2.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-15 (continued). Surface-Water Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	U[b] (μg/L)	U-234 (pCi/L)[c]	U-235 (pCi/L)[c]	U-238 (pCi/L)[c]	V (μg/L)	V[b] (μg/L)	Zn (μg/L)	Zn[b] (μg/L)
Upper North Drainage	NBD-545	05/06/1994	No Data	4.66	<0.12	4.50	~29.8	No Data	~6.9	No Data
	NBD-670	10/12/1994	35.0	24.13	1.57	23.30	~7.5	~15.1	~5.3	~2.3
W-2	NBD-539	05/04/1994	No Data	727.49	29.75	754.46	52000	No Data	~6.5	No Data
	NBD-668	10/11/1994	2660	844.25	35.66	839.47	33200	33100	~8.1	<2.0
W-4	NBD-534	05/03/1994	No Data	32.30	<0.73	28.74	128	No Data	21.6	No Data
	NBD-655	10/06/1994	163	54.09	2.61	52.44	414	400	~3.3	<2.0
	NBD-656	10/06/1994	153	54.77	2.18	50.53	404	411	~9.0	<2.0

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[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-16. Metals Data Obtained from Sediment Samples during 1994[a,b]

Location ID/Depth	Ag mg/kg	Al mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Co mg/kg	Cr mg/kg	Cu mg/kg	Fe mg/kg	Hg mg/kg	Mn mg/kg	Mo mg/kg	Ni mg/kg
S94-015 0-6"	<0.20	8870	5.8	130	~0.59	<0.20	~5.3	6.9	15.2	10900	~0.03	335	~1.5	11.7
S94-016 0-6"	<0.20	12100	9.0	184	~0.58	~0.21	~6.9	9.8	55.0	14600	~0.02	390	~1.7	12.4
S94-016 0-6" (Dup)	<0.20	10000	6.7	173	~0.50	~0.27	~6.9	8.0	51.3	13200	~0.02	357	~1.6	12.4
S94-016 6-12"	~0.29	6310	7.2	200	~0.36	~0.35	~6.0	5.2	116	10400	<0.02	279	~1.5	9.7
S94-016 12-18"	~0.26	8390	6.7	189	~0.45	~0.35	~6.9	7.0	106	11600	~0.02	236	~1.8	12.3
SS94-001 0-6"	<0.20	6380	5.3	158	~0.44	~0.29	~5.8	5.2	55.8	10100	~0.03	356	~1.7	10.1
SS94-001 6-12"	<0.20	6770	7.0	430	~0.47	<0.20	~4.0	5.7	22.0	10400	~0.02	358	~1.5	11.4
SS94-002 0-6"	<0.20	9440	5.8	139	~0.68	<0.20	~5.1	7.9	20.2	11000	~0.03	421	~0.87	12.6
SS94-002 0-6" (Dup)	<0.20	10200	3.0	144	~0.67	<0.20	~5.0	7.8	19.9	11600	~0.03	431	~0.89	13.5
SS94-003 0-6"	<0.20	7790	4.4	165	~0.50	<0.20	~6.0	6.0	76.6	10900	~0.03	353	~1.6	12.2
SS94-003 6-12"	<0.20	7370	8.3	184	~0.51	~0.22	~5.1	5.7	36.5	11700	~0.03	336	~1.9	10.7
SS94-003 12-18"	<0.20	7210	6.7	155	~0.48	<0.20	~4.4	5.5	45.8	11600	~0.03	315	~2.1	12.0
SS94-003 18-24"	<0.20	8010	5.4	148	~0.51	<0.20	~4.7	6.1	21.8	11900	~0.02	224	~2.4	11.3
SS94-003 18-24" (Dup)	<0.20	7740	5.7	149	~0.50	<0.20	~5.1	5.6	23.3	11600	~0.02	222	~2.3	10.2
SS94-004 0-6"	<0.20	6310	8.1	167	~0.51	<0.20	~5.2	5.1	71.2	9710	~0.03	347	~1.5	9.7
SS94-004 6-12"	<0.20	6680	5.8	147	~0.52	~0.43	~5.3	5.4	30.9	10800	~0.03	400	~2.3	10.0
SS94-004 12-18"	~0.29	5990	10.4	206	~0.38	~0.25	~6.6	4.6	238	10800	~0.02	441	~3.5	11.0
SS94-004 18-24"	~0.22	6190	19.7	245	~0.40	~0.49	~9.5	5.0	337	13100	~0.02	651	~6.5	10.7
SS94-005 0-6"	<0.20	7320	10.3	173	~0.53	~0.24	~5.9	6.0	83.8	11000	~0.03	391	~1.9	10.9
SS94-005 6-12"	<0.20	6800	6.2	141	~0.43	<0.20	~4.4	4.8	12.2	12300	~0.02	346	~1.8	8.6
SS94-006 0-6"	<0.20	9060	~3.0	141	~0.61	<0.20	~5.7	7.3	16.9	12100	<0.02	374	~0.95	11.5
SS94-006 6-12"	<0.20	8650	4.6	140	~0.65	<0.20	~5.4	6.3	18.4	11600	~0.03	372	~0.95	11.5
SS94-006 12-18"	<0.20	8760	4.3	136	~0.65	<0.20	~4.7	6.6	13.8	11600	~0.03	375	~0.89	13.1
SS94-006 18-24"	<0.20	8300	4.4	136	~0.63	<0.20	~4.0	6.6	13.0	11400	~0.03	377	~0.80	10.7
SS94-006 18-24" (Dup)	<0.20	9070	4.3	136	~0.66	<0.20	~4.8	7.4	13.9	12000	~0.03	386	~0.90	12.7
SS94-007 0-6"	~0.43	8510	4.3	147	~0.66	<0.20	~5.4	7.2	13.7	10100	<0.02	430	~0.73	10.6
SS94-008 0-6"	<0.20	8410	5.6	139	~0.56	<0.20	~4.6	6.3	12.6	11400	<0.02	422	~0.94	10.8
SS94-009 0-6"	~0.21	7840	11.4	231	~0.50	~0.78	~9.6	7.7	137	8190	<0.02	353	~2.5	11.1
SS94-009 6-12"	~0.28	7770	16.2	252	~0.52	~0.78	11.4	8.5	155	8550	<0.02	337	~2.7	12.1
SS94-009 12-18"	<0.20	8700	12.0	203	~0.50	~0.32	~6.4	7.7	49.1	11300	<0.02	359	~2.1	11.5
SS94-009 18-24"	<0.20	7060	8.8	178	~0.39	<0.20	~5.1	5.9	41.0	12100	<0.02	337	~1.9	10.4

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]mg/kg = milligrams per kilogram.

Table A-16 (continued). Metals Data Obtained from Sediment Samples during 1994[a,b]

Location ID/Depth	Ag mg/kg	Al mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Co mg/kg	Cr mg/kg	Cu mg/kg	Fe mg/kg	Hg mg/kg	Mn mg/kg	Mo mg/kg	Ni mg/kg
SS94-010 0-6"	<0.20	8730	8.3	148	~0.47	<0.20	~4.6	6.4	23.6	10800	<0.02	383	~1.3	9.1
SS94-010 6-12"	<0.20	5520	4.9	125	~0.39	<0.20	~4.6	4.5	23.6	8850	<0.02	164	~1.1	~7.8
SS94-010 12-18"	<0.20	6700	5.3	172	~0.46	<0.20	~5.0	5.4	28.7	10800	<0.02	222	~1.4	8.7
SS94-010 18-24"	<0.20	8460	5.8	173	~0.52	<0.20	~5.4	7.0	34.1	11400	<0.02	167	~1.5	11.5
SS94-011 0-6"	<0.20	7350	8.2	204	~0.48	<0.20	~5.0	5.9	46.6	12000	<0.02	327	~1.9	10.3
SS94-011 0-6" (Dup)	<0.20	8370	6.8	178	~0.47	<0.20	~5.6	6.3	18.8	11900	<0.02	359	~2.3	10.1
SS94-011 6-12"	<0.20	7470	11.5	219	~0.52	~0.28	~6.5	6.5	80.6	12100	<0.02	373	~2.5	11.9
SS94-011 12-18"	<0.20	7220	8.8	156	~0.51	<0.20	~5.5	5.5	27.1	12000	<0.02	412	~3.7	10.9
SS94-011 18-24"	<0.20	7990	13.7	157	~0.48	<0.20	~5.1	6.3	17.4	13700	<0.02	461	~4.6	11.4
SS94-012 0-6"	<0.20	8770	11.1	175	~0.39	~0.28	~6.4	7.0	92.0	15000	<0.02	392	~2.0	11.0
SS94-012 6-12"	<0.20	9700	11.4	209	~0.45	~0.33	~7.3	7.9	180	15500	<0.02	422	~1.9	10.9
SS94-012 12-18"	~0.22	9910	9.4	197	~0.46	~0.49	~8.0	8.0	168	12300	<0.02	360	~2.0	11.7
SS94-012 18-24"	~0.94	8550	18.4	361	~0.42	1.2	13.6	8.2	623	11400	<0.02	439	~2.9	11.2
SS94-013 0-6"	<0.20	9270	12.7	260	~0.45	~0.45	~7.1	8.4	193	12000	<0.02	366	~2.8	9.9
SS94-013 6-12"	~0.29	8190	16.5	374	~0.50	1.2	14.1	7.9	698	10900	~0.02	508	~4.3	11.2
SS94-013 12-18"	~0.41	8500	29.9	352	~0.53	1.3	15.5	8.9	634	13400	~0.03	418	~9.7	13.6
SS94-013 18-24"	~0.23	9900	34.2	233	~0.57	~0.66	~8.2	9.8	218	14800	~0.02	246	11.1	11.7
SS94-014 0-6"	<0.20	9900	4.6	144	~0.48	<0.20	~5.4	8.2	14.1	11500	<0.02	490	~0.93	9.2

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]mg/kg = milligrams per kilogram.

Table A-16 (continued). Metals Data Obtained from Sediment Samples during 1994[a,b]

Location ID/Depth	Pb mg/kg	Sb mg/kg	Se mg/kg	Sn mg/kg	Tl mg/kg	U mg/kg	V mg/kg	Zn mg/kg
S94-015 0-6"	10.4	<7.4	<0.60	1.4	<0.20	12.2	74.2	50.0
S94-016 0-6"	12.5	<0.20	1.5	2.2	~0.23	17.2	83.7	54.4
S94-016 0-6" (Dup)	11.8	<0.20	<3.0	2.2	~0.22	17.1	80.9	52.4
S94-016 6-12"	13.4	<0.20	<3.0	2.2	<0.20	18.9	102	48.3
S94-016 12-18"	14.2	<0.20	1.4	2.4	~0.23	17.1	82.9	51.2
SS94-001 0-6"	15.1	<7.4	<0.60	1.9	<0.20	31.2	132	52.1
SS94-001 6-12"	19.1	<7.4	<0.60	1.9	<0.20	13.6	66.4	44.8
SS94-002 0-6"	12.2	<7.4	<0.60	1.4	<0.20	6.9	40.2	56.2
SS94-002 0-6" (Dup)	12.1	<7.4	<0.60	1.3	<0.20	7.3	42.5	59.2
SS94-003 0-6"	14.2	<7.4	~0.74	1.5	<0.20	16.4	68.4	54.4
SS94-003 6-12"	15.1	<7.4	<0.60	2.2	<0.20	23.6	159	48.5
SS94-003 12-18"	14.1	<7.4	<0.60	1.9	<0.20	19.2	106	45.9
SS94-003 18-24"	12.3	<7.4	<0.60	2.8	<0.20	12.5	62.6	47.5
SS94-003 18-24" (Dup)	12.1	<7.4	<0.60	1.5	<0.20	12.8	59.7	47.8
SS94-004 0-6"	15.1	<7.4	<0.60	1.8	<0.20	44.1	120	47.5
SS94-004 6-12"	12.2	<7.4	<0.60	1.7	<0.20	17.9	44.2	42.5
SS94-004 12-18"	18.4	<7.4	1.3	1.9	~0.20	20.3	99.5	55.8
SS94-004 18-24"	22.3	<7.4	1.8	1.8	~0.26	23.4	187	66.9
SS94-005 0-6"	14.5	<7.4	<0.60	2.0	<0.20	33.5	180	49.5
SS94-005 6-12"	11.3	<7.4	<0.60	2.0	<0.20	8.9	45.2	42.8
SS94-006 0-6"	12.2	<7.4	<0.60	1.6	<0.20	6.4	34.2	60.5
SS94-006 6-12"	12.6	<7.4	<0.60	1.5	<0.20	8.1	41.0	55.2
SS94-006 12-18"	12.3	<7.4	<0.60	1.5	<0.20	6.0	26.4	54.6
SS94-006 18-24"	12.1	<7.4	<0.60	1.4	<0.20	5.0	24.3	54.8
SS94-006 18-24" (Dup)	13.1	<7.4	<0.60	1.6	~0.22	4.8	24.7	60.7
SS94-007 0-6"	10.6	<7.4	<0.60	1.7	<0.20	5.1	27.2	40.0
SS94-008 0-6"	11.8	<7.4	<0.60	1.5	<0.20	5.4	34.4	47.2
SS94-009 0-6"	22.5	<7.4	1.4	2.4	~0.29	98.9	488	66.4
SS94-009 6-12"	23.8	<7.4	~0.64	2.6	~0.30	118	673	57.0
SS94-009 12-18"	16.2	<7.4	~0.70	2.4	~0.22	54.9	364	47.5
SS94-009 18-24"	11.5	<7.4	<0.60	2.2	<0.20	29.3	64.3	43.2

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]mg/kg = milligrams per kilogram.

Table A-16 (continued). Metals Data Obtained from Sediment Samples during 1994[a,b]

Location ID/Depth	Pb mg/kg	Sb mg/kg	Se mg/kg	Sn mg/kg	Tl mg/kg	U mg/kg	V mg/kg	Zn mg/kg
SS94-010 0-6"	10.0	<7.4	<0.60	2.1	<0.20	21.8	126	38.4
SS94-010 6-12"	10.1	<7.4	<0.60	2.3	<0.20	28.2	166	32.8
SS94-010 12-18"	10.1	<7.4	<0.60	2.0	<0.20	14.2	65.8	39.6
SS94-010 18-24"	15.7	<7.4	<0.60	2.2	<0.20	18.9	114	44.2
SS94-011 0-6"	11.7	<7.4	<0.60	2.2	<0.20	16.1	64.0	45.6
SS94-011 0-6" (Dup)	12.2	<7.4	<0.60	2.2	<0.20	15.5	131	39.7
SS94-011 6-12"	15.7	<7.4	<0.60	2.1	<0.20	30.5	182	52.9
SS94-011 12-18"	14.3	<7.4	~0.60	1.7	<0.20	18.0	82.6	53.0
SS94-011 18-24"	11.6	<7.4	~0.62	1.8	<0.20	15.9	141	54.6
SS94-012 0-6"	12.4	<0.20	~0.95	2.6	~0.21	18.9	89.6	56.0
SS94-012 6-12"	13.4	<0.20	1.0	2.6	~0.24	20.9	131	53.8
SS94-012 12-18"	14.8	<0.20	1.1	2.6	~0.27	22.2	144	53.2
SS94-012 18-24"	29.6	<0.20	~3.9	2.5	~0.40	45.3	343	77.2
SS94-013 0-6"	14.9	<0.20	1.6	2.5	~0.63	26.5	91.9	56.3
SS94-013 6-12"	29.3	<0.20	4.4	2.3	~0.49	25.7	219	72.2
SS94-013 12-18"	32.1	<0.20	10.3	2.5	~0.53	66.6	392	80.4
SS94-013 18-24"	20.3	<0.20	15.8	2.7	~0.38	73.2	357	60.0
SS94-014 0-6"	8.5	<0.20	<0.60	2.4	<0.20	8.5	37.3	33.6

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]mg/kg = milligrams per kilogram.

Table A-17. Radionuclide Data Obtained from Sediment Samples during 1994

Location ID/Depth	K-40 pCi/g	Pb-210 pCi/g	Ra-226 pCi/g	Th-230 pCi/g	Th-232 pCi/g
S94-015 0-6"	18.98	<2	3.73	4.43	2.38
S94-016 0-6"	13.10	6.1	6.60	12.68	<0.37
S94-016 0-6" (Dup)	<2.21	6.3	4.07	12.21	<0.55
S94-016 6-12"	<2.11	16.4	7.92	29.14	<0.67
S94-016 12-18"	<2.25	13.9	6.64	20.03	<0.62
SS94-001 0-6"	16.30	16.3	35.53	36.16	2.95
SS94-001 6-12"	17.26	5.7	14.14	15.20	2.29
SS94-002 0-6"	19.59	<2	3.88	4.03	1.65
SS94-002 0-6" (Dup)	19.77	<2	3.66	3.84	1.95
SS94-003 0-6"	16.64	8.4	16.64	16.34	2.66
SS94-003 6-12"	20.05	16.1	32.86	38.69	<0.99
SS94-003 12-18"	16.15	9.8	22.82	23.68	1.63
SS94-003 18-24"	16.07	3.7	9.99	11.26	1.98
SS94-003 18-24" (Dup)	16.70	4.7	10.89	11.55	<0.60
SS94-004 0-6"	19.19	16.4	32.71	34.42	<0.57
SS94-004 6-12"	15.38	4.0	8.22	7.73	<0.31
SS94-004 12-18"	18.29	18.3	27.04	27.11	2.68
SS94-004 18-24"	22.75	43.8	56.73	61.61	2.56
SS94-005 0-6"	16.82	20.9	48.46	44.05	1.72
SS94-005 6-12"	16.15	3.0	7.22	8.54	<0.32
SS94-006 0-6"	15.78	<2	5.71	5.57	1.65
SS94-006 6-12"	17.51	2.8	7.58	7.37	2.53
SS94-006 12-18"	17.81	10.1	3.12	3.57	2.33
SS94-006 18-24"	18.78	<2	2.40	2.96	1.77
SS94-006 18-24" (Dup)	19.63	<2	2.56	2.88	2.15
SS94-007 0-6"	20.16	<2	3.89	3.54	1.91
SS94-008 0-6"	16.29	<2	3.86	4.50	1.90
SS94-009 0-6"	15.99	71.5	74.15	160.27	3.95
SS94-009 6-12"	16.66	88.4	136.88	202.95	5.75
SS94-009 12-18"	<2.08	30.0	50.94	73.79	<0.82
SS94-009 18-24"	17.59	10.7	23.89	25.55	<0.36
SS94-010 0-6"	15.94	12.3	23.13	28.29	3.24
SS94-010 6-12"	6.82	21.8	12.83	44.91	1.70
SS94-010 12-18"	<1.52	5.2	9.33	12.44	<0.24
SS94-010 18-24"	7.88	12.9	14.84	26.79	1.32
SS94-011 0-6"	13.18	4.0	11.99	11.09	3.04
SS94-011 0-6" (Dup)	13.65	6.8	11.00	10.94	2.29
SS94-011 6-12"	16.32	21.4	30.14	45.19	<0.69
SS94-011 12-18"	6.68	6.7	7.20	13.72	<0.19
SS94-011 18-24"	<1.51	4.8	5.14	8.06	1.31
SS94-012 0-6"	9.47	9.0	8.99	15.40	<0.59
SS94-012 6-12"	<1.89	17.4	11.43	26.24	<0.32
SS94-012 12-18"	<2.00	21.3	10.99	37.89	<0.49
SS94-012 18-24"	<2.67	70.5	46.18	116.32	4.77
SS94-013 0-6"	<2.83	10.5	3.94	24.59	<0.82
SS94-013 6-12"	<3.53	78.7	36.68	100.23	<1.26
SS94-013 12-18"	<4.27	113.2	60.24	145.09	<1.64
SS94-013 18-24"	<4.62	47.2	23.88	65.45	<0.95
SS94-014 0-6"	18.60	9.7	3.43	3.01	<0.35

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit).

[b]pCi/g = picocuries per gram.

Table A-18. Target Compound List of Organic Constituents Included in Analysis of Groundwater

CAS Number[a]	Constituent	Requested Reporting Limit[b] (μg/L)
Herbicides		
93-76-5	2,4,5-T	0.20
93-72-1	2,4,5-TP (Silvex)	0.17
94-75-7	2,4-D	1.2
94-82-6	2,4-DB	0.91
75-99-0	Dalapon	5.8
120-36-5	Dichloroprop	0.65
Pesticides		
72-54-8	4,4'-DDD	0.10
72-55-9	4,4'-DDE	0.10
50-29-3	4,4'-DDT	0.10
309-00-2	Aldrin	0.05
319-84-6	alpha-BHC	0.05
5103-71-9	alpha-Chlordane	0.05
12674-11-2	Aroclor-1016	0.5
11104-28-2	Aroclor-1221	0.5
11141-16-5	Aroclor-1232	0.5
53469-21-9	Aroclor-1242	0.5
12672-29-6	Aroclor-1248	0.5
11097-69-1	Aroclor-1254	1.0
11096-82-5	Aroclor-1260	1.0
319-85-7	beta-BHC	0.05
319-86-8	delta-BHC	0.05
60-57-1	Dieldrin	0.10
959-98-8	Endosulfan I	0.05
33213-65-9	Endosulfan II	0.10
1031-07-8	Endosulfan Sulfate	0.10
72-20-8	Endrin	0.10
7421-93-4	Endrin Aldehyde	0.10
58-89-9	gamma-BHC (Lindane)	0.05
5103-74-2	gamma-Chlordane	0.05
76-44-8	Heptachlor	0.05
1024-57-3	Heptachlor Epoxide	0.05
72-43-5	Methoxychlor	0.5
8001-35-2	Toxaphene	1.0
Semivolatile Organics		
120-82-1	1,2,4-Trichlorobenzene	10
95-50-1	1,2-Dichlorobenzene	10
541-73-1	1,3-Dichlorobenzene	10
106-46-7	1,4-Dichlorobenzene	10

[a]CAS = Chemical Abstracts Service.
[b]Actual laboratory reporting limits may vary.

Table A-18 (continued). Target Compound List of Organic Constituents Included in Analysis of Groundwater

CAS Number[a]	Constituent	Requested Reporting Limit[b] (μg/L)
Semivolatile Organics (continued)		
108-60-1	2,2-oxybis(1-Chloropropane)	10
95-95-4	2,4,5-Trichlorophenol	50
88-06-2	2,4,6-Trichlorophenol	10
120-83-2	2,4-Dichlorophenol	10
105-67-9	2,4-Dimethylphenol	10
51-28-5	2,4-Dinitrophenol	50
121-14-2	2,4-Dinitrotoluene	10
606-20-2	2,6-Dinitrotoluene	10
91-58-7	2-Chloronaphthalene	10
95-57-8	2-Chlorophenol	10
91-57-6	2-Methylnaphthalene	10
95-48-7	2-Methylphenol	10
88-74-4	2-Nitroaniline	50
88-75-5	2-Nitrophenol	10
91-94-1	3,3'-Dichlorobenzidine	20
99-09-2	3-Nitroaniline	50
534-52-1	4,6-Dinitro-2-Methylphenol	50
101-55-3	4-Bromophenyl-phenylether	10
59-50-7	4-Chloro-3-methylphenol	10
106-47-8	4-Chloroaniline	10
7005-72-3	4-Chlorophenyl phenyl ether	10
106-44-5	4-Methylphenol	10
100-01-6	4-Nitroaniline	50
100-02-7	4-Nitrophenol	50
83-32-9	Acenaphthene	10
208-96-8	Acenaphthylene	10
120-12-7	Anthracene	10
56-55-3	Benzo(a)anthracene	10
50-32-8	Benzo(a)pyrene	10
205-99-2	Benzo(b)fluoranthene	10
191-24-2	Benzo(g,h,i)perylene	10
207-08-9	Benzo(k)fluoranthene	10
111-91-1	bis(2-Chloroethoxy)Methane	10
111-44-4	bis(2-Chloroethyl)Ether	10
117-81-7	bis(2-ethylhexyl)Phthalate	10
85-68-7	Butyl benzyl phthalate	10
218-01-9	Chrysene	10
84-74-2	di-n-Butylphthalate	10
117-84-0	di-n-Octylphthalate	10
53-70-3	Dibenzo(a,h)anthracene	10
132-64-9	Dibenzofuran	10
84-66-2	Diethylphthalate	10
131-11-3	Dimethylphthalate	10
206-44-0	Fluoranthene	10
86-73-7	Fluorene	10

[a]CAS = Chemical Abstracts Service.
[b]Actual laboratory reporting limits may vary.

Table A-18 (continued). Target Compound List of Organic Constituents Included in Analysis of Groundwater

CAS Number[a]	Constituent	Requested Reporting Limit[b] (μg/L)
Semivolatile Organics (continued)		
118-74-1	Hexachlorobenzene	10
87-68-3	Hexachlorobutadiene	10
77-47-4	Hexachlorocyclopentadiene	10
67-72-1	Hexachloroethane	10
193-39-5	Indeno(1,2,3-cd)pyrene	10
78-59-1	Isophorone	10
621-64-7	N-Nitroso-di-n-dipropylamine	10
86-30-6	N-Nitrosodiphenylamine	10
91-20-3	Naphthalene	10
98-95-3	Nitrobenzene	10
87-86-5	Pentachlorophenol	50
85-01-8	Phenanthrene	10
108-95-2	Phenol	10
129-00-0	Pyrene	10
Volatile Organics		
71-55-6	1,1,1-Trichloroethane	1
79-34-5	1,1,2,2-Tetrachloroethane	1
79-00-5	1,1,2-Trichloroethane	1
75-34-3	1,1-Dichloroethane	1
75-35-4	1,1-Dichloroethene	1
107-06-2	1,2-Dichloroethane	1
78-87-5	1,2-Dichloropropane	1
78-93-3	2-Butanone	2
591-78-6	2-Hexanone	2
108-10-1	4-Methyl-2-Pentanone	2
67-64-1	Acetone	2
71-43-2	Benzene	1
75-27-4	Bromodichloromethane	1
75-25-2	Bromoform	1
74-83-9	Bromomethane	2
75-15-0	Carbon Disulfide	1
56-23-5	Carbon Tetrachloride	1
108-90-7	Chlorobenzene	1
75-00-3	Chloroethane	2
67-66-3	Chloroform	1
74-87-3	Chloromethane	2
10061-01-5	cis-1,3-Dichloropropene	1
124-48-1	Dibromochloromethane	1
100-41-4	Ethyl benzene	1
75-09-2	Methylene Chloride	1
100-42-5	Styrene	1
127-18-4	Tetrachloroethene	1

[a]CAS = Chemical Abstracts Service.
[b]Actual laboratory reporting limits may vary.

Table A-18 (continued). Target Compound List of Organic Constituents Included in Analysis of Groundwater

CAS Number[a]	Constituent	Requested Reporting Limit[b] (μg/L)
Volatile Organics (continued)		
108-88-3	Toluene	1
156-60-5	trans-1,2-Dichloroethene	1
10061-02-6	trans-1,3-Dichloropropene	1
79-01-6	Trichloroethene	1
108-05-4	Vinyl Acetate	2
75-01-4	Vinyl Chloride	2
1330-20-7	Xylenes (total)	1

[a]CAS = Chemical Abstracts Service.
[b]Actual laboratory reporting limits may vary.

Table A-19. Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ag (μg/L)	Al (μg/L)	Alkalinity (as $CaCO_3$) (ppm)	Alpha (pCi/L)[b]	As (μg/L)	B (μg/L)	Ba (μg/L)	Beta (pCi/L)[b]	Ca[c] (mg/L)
31NE93-205	NBD-550	05/11/1994	<4.0	~24.0	161	<36	13.2	~57.0	~39.5	<33	107
	NBD-167	10/11/1994	<1.0	<10.0	144	<29	25.5	~49.1	~34.8	<20	99.9
31SW91-03	NBD-569	05/05/1994	<4.0	~76.3	436	1490	70.2	112	~17.9	320	215
	NBD-174	10/13/1994	<1.0	~10.6	434	1289	73.1	103	~16.9	737	208
31SW91-14	NBD-565	05/04/1994	<4.0	~25.1	493	3170	60.0	126	~15.7	689	220
	NBD-172	10/13/1994	<1.0	~26.6	455	3170	56.9	108	~17.7	1467	210
31SW91-23	NBD-567	05/05/1994	<4.0	~52.5	432	643	<2.0	144	~8.2	306	363
	NBD-170	10/13/1994	<1.0	~28.2	365	960	<2.0	160	~9.6	569	385
36SE93-201-2	NBD-544	05/05/1994	<4.0	9670	No Data	3790	369	439	212	1084	86.9
	NBD-672	10/12/1994	~1.0	4740	750	5970	611	738	~97.6	2920	104
82-07	NBB-579	05/10/1994	<4.0	<9.0	373	209	<2.0	121	~41.6	124	316
	NBD-164	10/10/1994	<1.0	<10.0	377	298	<2.0	136	~50.3	124	293
82-30B	NBD-568	05/05/1994	<4.0	~18.7	396	209	111	102	~40.0	235	182
	NBD-173	10/13/1994	<1.0	<10.0	384	963	120	113	~42.4	423	177
82-31B-E	NBB-578	05/09/1994	<4.0	<9.0	344	<56	<2.0	101	~14.3	<49	495
	NBD-169	10/12/1994	<1.0	<10.0	324	<122	<2.0	171	~9.7	<101	607
82-40A	NBD-566	05/04/1994	<4.0	~37.1	448	<51	64.0	119	~17.6	<49	252
	NBD-673	10/13/1994	<1.0	~68.6	535	6870	84.4	133	~19.3	4230	280
	NBD-674	10/13/1994	<1.0	~61.3	No Data	7540	83.3	135	~18.5	4190	272
82-42	NBD-571	05/09/1994	<4.0	~99.1	300	43	~2.5	~69.0	~46.0	<20	258
	NBD-572	05/09/1994	<4.0	~87.7	No Data	<32	~4.8	~69.8	~45.2	<20	257
	NBD-171	10/13/1994	<1.0	~12.2	249	<50	~5.7	~64.0	~45.8	<40	255
83-70	NBD-548	05/10/1994	<4.0	~13.1	236	<11.6	<2.0	~38.7	~18.5	<9.8	53.3
	NBD-165	10/11/1994	<1.0	<10.0	152	<21	<2.0	~32.8	~19.1	<20	52.1
88-85	NBD-561	05/03/1994	<4.0	~143	400	426	~7.0	136	~33.2	156	296
	NBD-161	10/06/1994	<1.0	~95.6	400	307	11.4	129	~33.1	210	277
92-01	NBD-559	05/02/1994	<4.0	~37.0	237	<39	<2.0	~50.8	~20.0	<33	413
	NBD-154	10/04/1994	<1.0	287	303	<54	<2.0	~73.3	~25.7	<52	456
92-02	NBD-560	05/03/1994	<4.0	~9.5	159	<7.6	~6.6	~28.8	~34.0	<6.6	57.5
	NBD-151	10/03/1994	<1.0	~20.6	174	<8.3	~6.9	~28.8	~35.1	<7.1	57.3
92-03	NBD-554	04/26/1994	<4.0	351	171	<15.8	<2.0	~33.9	~56.8	<10.1	112
	NBD-153	10/04/1994	<1.0	~71.0	256	<18.1	<2.0	~40.9	~62.3	<14.2	138

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ag (μg/L)	Al (μg/L)	Alkalinity (as $CaCO_3$) (ppm)	Alpha (pCi/L)[b]	As (μg/L)	B (μg/L)	Ba (μg/L)	Beta (pCi/L)[b]	Ca[c] (mg/L)
92-04	NBD-553	04/26/1994	<4.0	~23.0	154	<12.5	15.8	~39.7	~34.9	<9.9	74.2
	NBD-152	10/04/1994	<1.0	~20.1	211	<15.5	11.5	~34.8	~29.3	<14.1	69.8
92-05	NBD-557	05/02/1994	<4.0	~56.9	214	<44	<2.0	~44.0	~38.1	<48	291
	NBD-158	10/05/1994	<1.0	2050	324	<31	<2.0	~67.8	~67.3	<24	258
92-06	NBD-555	04/26/1994	<4.0	~11.9	130	<11.4	~4.6	~32.3	~20.1	<9.8	70.9
	NBD-159	10/06/1994	<1.0	~31.0	237	<14.7	~3.0	~34.0	~21.5	<14.1	69.9
92-07	NBB-580	05/10/1994	<4.0	~10.4	399	1070	13.0	101	~54.8	330	246
	NBD-163	10/10/1994	<1.0	~10.6	415	867	16.6	104	~55.2	384	236
92-08	NBD-573	05/09/1994	<4.0	~12.7	350	333	<2.0	~89.3	~33.9	254	277
	NBD-162	10/07/1994	<1.0	<10.0	304	321	<2.0	120	~33.3	206	231
92-09	NBD-575	05/10/1994	<4.0	<9.0	344	239	<2.0	129	~11.0	75	286
	NBD-156	10/05/1994	<1.0	<10.0	367	213	<2.0	162	~16.6	148	270
	NBD-157	10/05/1994	<1.0	~10.4	No Data	227	<2.0	157	~15.2	151	264
92-10	NBD-574	05/09/1994	<4.0	~21.4	184	<11.8	~3.8	~37.7	~22.1	<9.8	76.8
	NBD-155	10/05/1994	<1.0	<10.0	201	<15.7	~2.0	~30.3	~22.5	<14.1	76.6
92-11	NBD-562	05/03/1994	<4.0	~140	386	1280	40.2	109	~20.5	346	225
	NBD-563	05/03/1994	<4.0	~122	No Data	1140	38.9	111	~20.3	330	221
	NBD-160	10/06/1994	<1.0	~41.1	410	862	42.2	102	~20.3	547	225
92-12	NBD-564	05/03/1994	<4.0	790	254	884	<2.0	~95.7	~57.7	321	34.0
	NBD-669	10/12/1994	<1.0	4150	278	<22	~4.4	~85.2	~146	<20	44.8
92-13	NBD-556	05/02/1994	<4.0	580	214	<16.0	25.6	149	~42.1	<19.0	11.7
	NBD-671	10/12/1994	<1.0	1860	284	<23	48.3	163	~54.0	<20	10.8
93-01	NBD-570	05/06/1994	<4.0	~17.6	212	<8.8	~4.8	~37.5	~21.7	<9.6	67.7
	NBD-168	10/12/1994	<1.0	<10.0	172	<14.6	~3.9	~24.5	~24.1	<10.2	66.5

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Cd (μg/L)	CDT[b] (μmhos/cm)	Cl[c] (mg/L)	Cr (μg/L)	Cu (μg/L)	DO[d] (mg/L)	Eh[e] (mV)	F (μg/L)	Fe (μg/L)
31NE93-205	NBD-550	05/11/1994	<1.0	1215	2.5	<4.0	~3.2	0.08	-78	~75.3	845
	NBD-167	10/11/1994	<1.0	1196	2.51	<2.0	<4.0	0.38	-188	~80.5	1210
31SW91-03	NBD-569	05/05/1994	<1.0	2880	89.7	~6.3	<2.0	1.01	170	565	~95.4
	NBD-174	10/13/1994	<1.0	No Data	99.3	<2.0	<4.0	1.61	148	553	~20.2
31SW91-14	NBD-565	05/04/1994	<1.0	3650	123	~5.6	<2.0	3.09	221	701	~16.9
	NBD-172	10/13/1994	<1.0	3800	144	~2.3	<4.0	1.80	201	791	~43.5
31SW91-23	NBD-567	05/05/1994	<1.0	4400	33.0	<4.0	<2.0	4.95	210	675	~43.6
	NBD-170	10/13/1994	<1.0	4580	38.5	<2.0	<4.0	1.93	164	539	~16.5
36SE93-201-2	NBD-544	05/05/1994	<1.0	7960	602	~8.7	76.9	No Data	No Data	3520	11100
	NBD-672	10/12/1994	<1.0	7900	747	<2.0	52.3	No Data	No Data	5660	3820
82-07	NBB-579	05/10/1994	<1.0	2520	116	<4.0	<2.0	1.06	169	210	~6.3
	NBD-164	10/10/1994	<1.0	2510	128	<2.0	<4.0	1.75	216	202	~8.6
82-30B	NBD-568	05/05/1994	<1.0	2080	60.6	<4.0	<2.0	2.63	129	559	~51.9
	NBD-173	10/13/1994	<1.0	2120	67.1	<2.0	<4.0	1.50	129	736	~46.1
82-31B-E	NBB-578	05/09/1994	<1.0	2800	22.7	<4.0	<2.0	3.69	216	~60.3	~7.3
	NBD-169	10/12/1994	<1.0	3260	36	<2.0	<4.0	3.43	66	~85.1	~7.8
82-40A	NBD-566	05/04/1994	<1.0	3130	74.0	~7.1	~2.3	1.82	-52	880	5380
	NBD-673	10/13/1994	<1.0	3840	88.3	~6.9	~6.1	2.24	-24	986	7550
	NBD-674	10/13/1994	<1.0	No Data	88	~7.4	~4.3	No Data	No Data	1350	7220
82-42	NBD-571	05/09/1994	<1.0	1642	62.3	<4.0	<2.0	2.32	132	~84.7	115
	NBD-572	05/09/1994	<1.0	No Data	62.8	<4.0	<2.0	No Data	No Data	~82.9	112
	NBD-171	10/13/1994	<1.0	1671	18.8	<2.0	<4.0	2.02	166	~92.4	~35.3
83-70	NBD-548	05/10/1994	<1.0	620	2.9	<4.0	<2.0	0.78	17	~136	370
	NBD-165	10/11/1994	<1.0	620	2.95	<2.0	<4.0	0.60	-94	~153	353
88-85	NBD-561	05/03/1994	<1.0	2570	140	<4.0	~3.4	1.50	161	235	129
	NBD-161	10/06/1994	<1.0	2490	129	<2.0	~11.1	1.09	0.94	217	112
92-01	NBD-559	05/02/1994	<1.0	2250	11.9	<4.0	<2.0	5.40	154	~62.3	~55.8
	NBD-154	10/04/1994	<1.0	2380	7.99	<2.0	<4.0	5.29	198	~77.5	409
92-02	NBD-560	05/03/1994	<1.0	396	1.1	<4.0	<2.0	1.16	-40	~126	~56.8
	NBD-151	10/03/1994	<1.0	395	1.14	<2.0	<4.0	1.33	17	~79.3	115
92-03	NBD-554	04/26/1994	<1.0	747	8.8	~4.3	<2.0	3.60	119	~128	219
	NBD-153	10/04/1994	<1.0	876	13	<2.0	<4.0	2.60	196	~113	~77.9

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Conductivity in micromhos per centimeter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Dissolved oxygen.

[e]The oxidation-reduction potential (in millivolts) is a measure of the relative tendency of a solution to accept an electron (negative Eh value indicating reduction) or to transfer an electron (positive Eh value indicating oxidation).

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Cd (μg/L)	CDT[b] (μmhos/cm)	Cl[c] (mg/L)	Cr (μg/L)	Cu (μg/L)	DO[d] (mg/L)	Eh[e] (mV)	F (μg/L)	Fe (μg/L)
92-04	NBD-553	04/26/1994	<1.0	646	2.7	~8.4	<2.0	0.81	-16	~132	211
	NBD-152	10/04/1994	<1.0	641	2.73	<2.0	<4.0	1.60	71	~120	~79.1
92-05	NBD-557	05/02/1994	<1.0	1682	9.5	<4.0	<2.0	7.58	69	~82.7	~54.7
	NBD-158	10/05/1994	<1.0	1523	11.4	<2.0	<4.0	5.46	214	~53.6	2720
92-06	NBD-555	04/26/1994	<1.0	558	1.8	<4.0	<2.0	4.75	17	~126	~96.3
	NBD-159	10/06/1994	<1.0	559	1.9	<2.0	<4.0	5.12	0.50	~107	120
92-07	NBB-580	05/10/1994	<1.0	2440	92.7	<4.0	<2.0	2.54	144	302	~8.4
	NBD-163	10/10/1994	<1.0	2330	95.9	<2.0	<4.0	3.64	152	226	<6.0
92-08	NBD-573	05/09/1994	<1.0	2240	74.9	<4.0	<2.0	1.85	169	~150	~5.9
	NBD-162	10/07/1994	<1.0	1965	42	<2.0	<4.0	.53	0.80	~119	<6.0
92-09	NBD-575	05/10/1994	<1.0	2590	101	<4.0	<2.0	1.43	88	~100	1040
	NBD-156	10/05/1994	<1.0	2480	86.4	<2.0	<4.0	1.11	20	~94.1	1180
	NBD-157	10/05/1994	<1.0	No Data	87.4	<2.0	<4.0	No Data	No Data	~74.5	1150
92-10	NBD-574	05/09/1994	<1.0	718	14.0	<4.0	<2.0	8.70	-7	~116	2400
	NBD-155	10/05/1994	<1.0	725	15.6	<2.0	<4.0	0.87	-47	~123	545
92-11	NBD-562	05/03/1994	<1.0	2540	87.4	<4.0	<2.0	0.57	151	400	257
	NBD-563	05/03/1994	<1.0	No Data	86.4	<4.0	~2.2	No Data	No Data	400	226
	NBD-160	10/06/1994	<1.0	2550	95.6	<2.0	<4.0	1.40	208	384	~71.2
92-12	NBD-564	05/03/1994	<1.0	867	4.9	<4.0	<2.0	No Data	No Data	472	603
	NBD-669	10/12/1994	<1.0	779	4.51	<2.0	~10.7	No Data	No Data	503	5690
92-13	NBD-556	05/02/1994	<1.0	805	5.0	<4.0	<2.0	No Data	No Data	1800	319
	NBD-671	10/12/1994	<1.0	751	4.71	<2.0	~8.8	No Data	No Data	1880	1440
93-01	NBD-570	05/06/1994	<1.0	598	2.1	<4.0	<2.0	0.62	-117	~136	109
	NBD-168	10/12/1994	<1.0	597	2.22	<2.0	<4.0	1.22	85	~120	~60.5

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Conductivity in micromhos per centimeter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Dissolved oxygen.

[e]The oxidation-reduction potential (in millivolts) is a measure of the relative tendency of a solution to accept an electron (negative Eh value indicating reduction) or to transfer an electron (positive Eh value indicating oxidation).

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	H_2O Depth (feet)	Herbicide (µg/L)	K[b] (mg/L)	Mg[b] (mg/L)	Mn (µg/L)	Mo (µg/L)	Na[b] (mg/L)	NH_4 (µg/L)	Ni (µg/L)
31NE93-205	NBD-550	05/11/1994	177.55	No Data	5.6	33.3	951	<27.0	116	342	<6.0
	NBD-167	10/11/1994	177.56	No Data	5.11	31.3	1020	~1.3	108	627	<8.0
31SW91-03	NBD-569	05/05/1994	53.45	No Detect	36.6	58.4	6690	263	360	10100	~7.3
	NBD-174	10/13/1994	2859	No Data	37	60	6840	279	338	9400	<8.0
31SW91-14	NBD-565	05/04/1994	44.28	No Detect	50.4	68.6	11400	463	527	18600	~12.3
	NBD-172	10/13/1994	44.61	No Data	50.2	69	11000	523	546	20400	~14.1
31SW91-23	NBD-567	05/05/1994	No Data	No Data	5.7	133	291	489	637	8520	<6.0
	NBD-170	10/13/1994	No Data	No Data	5.23	137	260	480	639	9780	<8.0
36SE93-201-2	NBD-544	05/05/1994	6.0	No Data	78.9	11.0	497	1640	1520	1220	~23.3
	NBD-672	10/12/1994	7.47	No Data	49.3	14.1	511	~1830	1720	987	~26.0
82-07	NBB-579	05/10/1994	9.40	No Data	10.1	74.6	137	<27.0	183	32.9	<6.0
	NBD-164	10/10/1994	9.72	No Data	10.8	64.8	90.3	~49.2	172	34.4	<8.0
82-30B	NBD-568	05/05/1994	14.75	No Detect	36.6	37.0	5320	180	221	2460	<6.0
	NBD-173	10/13/1994	18.10	No Data	36.1	37.3	5160	197	221	2900	<8.0
82-31B-E	NBB-578	05/09/1994	4.82	No Data	~3.5	99.1	~12.5	<27.0	123	61.7	<6.0
	NBD-169	10/12/1994	4.03	No Data	6.99	117	70.6	<1.0	165	408	<8.0
82-40A	NBD-566	05/04/1994	19.20	No Data	23.6	35.6	3890	422	430	3300	~8.0
	NBD-673	10/13/1994	21.5	No Data	24.4	39	4620	919	706	5200	~18.9
	NBD-674	10/13/1994	No Data	No Data	23	38.2	4510	852	667	4960	~15.4
82-42	NBD-571	05/09/1994	37.10	No Data	5.3	41.5	269	<27.0	57.1	50.2	<6.0
	NBD-572	05/09/1994	No Data	No Data	~4.9	41.2	266	<27.0	56.2	42.6	<6.0
	NBD-171	10/13/1994	38.58	No Data	~4.18	41.9	289	~3.3	55.1	1140	<8.0
83-70	NBD-548	05/10/1994	17.5	No Data	~2.8	11.6	266	<27.0	65.8	258	<6.0
	NBD-165	10/11/1994	33.25	No Data	~1.77	11.2	269	<1.0	63.2	294	<8.0
88-85	NBD-561	05/03/1994	7.34	No Detect	10.1	73.5	~6.5	~37.0	205	203	<6.0
	NBD-161	10/06/1994	7.93	No Data	9.71	72.7	~12.8	~49.0	192	119	<8.0
92-01	NBD-559	05/02/1994	21.53	No Data	~2.1	66.5	~2.9	<27.0	53.1	58.8	<6.0
	NBD-154	10/04/1994	No Data	No Data	~1.55	73	31.9	<1.0	54.7	40.3	<8.0
92-02	NBD-560	05/03/1994	186.76	No Data	~1.4	8.5	486	<27.0	10.8	96.3	<6.0
	NBD-151	10/03/1994	186.75	No Data	<.672	8.19	511	~3.0	10.8	68.8	<8.0
92-03	NBD-554	04/26/1994	10.32	No Data	~1.2	14.7	21.4	<27.0	24.8	30.0	<6.0
	NBD-153	10/04/1994	No Data	No Data	~2.1	18.7	27.1	~2.6	29.2	145	<8.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	H_2O Depth (feet)	Herbicide (μg/L)	K[b] (mg/L)	Mg[b] (mg/L)	Mn (μg/L)	Mo (μg/L)	Na[b] (mg/L)	NH_4 (μg/L)	Ni (μg/L)
92-04	NBD-553	04/26/1994	172.50	No Data	~2.5	12.0	467	<27.0	45.5	187	~8.1
	NBD-152	10/04/1994	172.38	No Data	~1.76	11.5	442	~21.9	44.7	204	<8.0
92-05	NBD-557	05/02/1994	14.58	No Detect	~1.9	45.8	~1.9	<27.0	36.0	35.7	<6.0
	NBD-158	10/05/1994	No Data	No Data	~3.83	41	181	~3.6	38.1	87.0	<8.0
92-06	NBD-555	04/26/1994	109.00	No Data	~1.8	10.5	434	<27.0	30.1	171	<6.0
	NBD-159	10/06/1994	109.21	No Data	~1.46	10.8	426	~1.7	31.6	306	<8.0
92-07	NBB-580	05/10/1994	No Data	No Data	22.0	54.0	271	134	268	229	<6.0
	NBD-163	10/10/1994	No Data	No Data	19.8	52.8	359	146	228	583	<8.0
92-08	NBD-573	05/09/1994	9.18	No Data	11.2	59.3	1030	71.6	161	47.3	<6.0
	NBD-162	10/07/1994	8.95	No Data	10.7	49.1	862	89.5	149	31.5	<8.0
92-09	NBD-575	05/10/1994	10.48	No Data	~0.77	72.9	128	<27.0	235	117	<6.0
	NBD-156	10/05/1994	11.15	No Data	~1.62	68.6	141	~2.8	223	306	<8.0
	NBD-157	10/05/1994	No Data	No Data	~.876	67.3	139	~2.9	219	262	<8.0
92-10	NBD-574	05/09/1994	12.59	No Data	~2.9	13.9	336	<27.0	56.7	251	<6.0
	NBD-155	10/05/1994	13.82	No Data	~2.68	13.8	342	~1.1	55.8	283	<8.0
92-11	NBD-562	05/03/1994	16.24	No Data	29.4	54.6	1080	240	296	4280	<6.0
	NBD-563	05/03/1994	No Data	No Data	30.4	54.3	1080	219	291	4220	<6.0
	NBD-160	10/06/1994	No Data	No Data	27.6	54	2180	229	275	4760	<8.0
92-12	NBD-564	05/03/1994	53.38	No Data	~4.2	9.8	21.9	109	141	44.4	<6.0
	NBD-669	10/12/1994	53.72	No Data	~4.55	11.1	247	101	134	95.8	<8.0
92-13	NBD-556	05/02/1994	105.84	No Data	~3.3	~1.7	~12.1	118	157	3600	<6.0
	NBD-671	10/12/1994	106.2	No Data	~2.67	~1.55	51.6	146	152	2200	<8.0
93-01	NBD-570	05/06/1994	106.66	No Data	~2.3	11.7	380	<27.0	40.3	235	<6.0
	NBD-168	10/12/1994	106.90	No Data	~1.88	11.6	388	~1.2	41.2	408	<8.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	NO_2 (μg/L)	NO_3+NO_2-N[b] (μg/L)	Pb (μg/L)	Pb-210 (pCi/L)[c]	Pesticide (μg/L)	pH	Po-210 (pCi/L)[c]	Ra-226 (pCi/L)[c]	Ra-228 (pCi/L)[c]
31NE93-205	NBD-550	05/11/1994	No Data	~8.9	<1.0	2.42	No Data	6.79	<0.26	1.87	<4.0
	NBD-167	10/11/1994	No Data	~27.3	<1.0	<2	No Data	6.36	<0.5	2.02	3.4
31SW91-03	NBD-569	05/05/1994	No Data	832	<1.0	3.2	No Detect	6.79	<0.16	0.20	<2.1
	NBD-174	10/13/1994	No Data	664	<1.0	6.1	No Data	6.57	<0.5	<0.5	<2.4
31SW91-14	NBD-565	05/04/1994	No Data	1100	<1.0	<2	No Detect	6.76	0.12	<0.10	<1.9
	NBD-172	10/13/1994	No Data	1020	<1.0	6.0	No Data	6.00	<0.5	<0.5	<2.3
31SW91-23	NBD-567	05/05/1994	~135	43200	<1.0	2.0	No Data	7.14	0.27	<0.28	<5.1
	NBD-170	10/13/1994	1970	42600	<1.0	7.5	No Data	6.35	<0.5	<0.5	<3.5
36SE93-201-2	NBD-544	05/05/1994	No Data	143	15.5	79.0	No Data	8.44	20.27	0.84	<3.5
	NBD-672	10/12/1994	No Data	~76.6	12.9	91.0	No Data	8.32	3.77	<0.5	<5.1
82-07	NBB-579	05/10/1994	No Data	2740	<1.0	3.64	No Data	6.77	<0.11	<0.05	<2.6
	NBD-164	10/10/1994	No Data	2400	<1.0	<2	No Data	6.08	<0.5	<0.5	<1.7
82-30B	NBD-568	05/05/1994	No Data	~18.4	<1.0	<2	No Detect	7.04	0.27	0.25	<2.0
	NBD-173	10/13/1994	No Data	~92.2	<1.0	6.8	No Data	6.47	<0.5	<0.5	<3.1
82-31B-E	NBB-578	05/09/1994	No Data	5700	<1.0	<2	No Data	6.83	<0.12	<0.04	<3.0
	NBD-169	10/12/1994	No Data	1300	<1.0	<2	No Data	6.31	<0.5	<0.5	<2.4
82-40A	NBD-566	05/04/1994	No Data	131	<1.0	31.6	No Data	6.99	<0.11	9.16	<5.9
	NBD-673	10/13/1994	No Data	~112	<1.0	49.7	No Data	6.80	4.22	11.29	<6.6
	NBD-674	10/13/1994	No Data	~114	<1.0	26.1	No Data	No Data	3.54	11.57	<8.0
82-42	NBD-571	05/09/1994	No Data	656	<1.0	<2	No Data	6.73	<0.08	0.22	<1.5
	NBD-572	05/09/1994	No Data	678	<1.0	2.27	No Data	No Data	<0.14	0.23	<1.3
	NBD-171	10/13/1994	No Data	~214	<1.0	<2	No Data	6.38	<0.5	<0.5	<2.0
83-70	NBD-548	05/10/1994	No Data	~9.5	<1.0	<2	No Data	7.47	<0.10	1.04	<2.0
	NBD-165	10/11/1994	No Data	~71.4	<1.0	<2	No Data	6.86	<0.5	1.26	<3.3
88-85	NBD-561	05/03/1994	No Data	3700	<1.0	<2	No Detect	6.78	<0.11	0.10	<1.5
	NBD-161	10/06/1994	No Data	1980	~1.3	<2	No Data	6.28	<0.5	<0.5	<2.4
92-01	NBD-559	05/02/1994	No Data	730	<1.0	<2	No Data	6.37	<0.20	<0.21	<3.8
	NBD-154	10/04/1994	No Data	~155	<1.0	<2	No Data	6.52	<0.5	<0.5	<4.7
92-02	NBD-560	05/03/1994	No Data	~68.7	<1.0	<2	No Data	7.32	<0.12	0.56	<1.9
	NBD-151	10/03/1994	No Data	~63.5	<1.0	<2	No Data	7.21	<0.5	<0.5	<3.8
92-03	NBD-554	04/26/1994	No Data	~61.0	~1.6	<2	No Data	7.18	<0.10	<0.10	<3.3
	NBD-153	10/04/1994	No Data	~191	3.2	<2	No Data	7.23	<0.5	<0.5	<2.9

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b](Nitrate + nitrite) as nitrogen. The samples were acidified in the field, thus the nitrite was oxidized to nitrate.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	NO_2 (μg/L)	NO_3+NO_2-N[b] (μg/L)	Pb (μg/L)	Pb-210 (pCi/L)[c]	Pesticide (μg/L)	pH	Po-210 (pCi/L)[c]	Ra-226 (pCi/L)[c]	Ra-228 (pCi/L)[c]
92-04	NBD-553	04/26/1994	No Data	~24.1	<1.0	<2	No Data	7.08	<0.10	0.45	<2.5
	NBD-152	10/04/1994	No Data	~57.3	<1.0	<2	No Data	7.19	<0.5	0.58	<2.2
92-05	NBD-557	05/02/1994	No Data	601	<1.0	<2	No Detect	6.92	<0.08	<0.06	<2.0
	NBD-158	10/05/1994	No Data	2140	3.1	<2	No Data	6.54	<0.5	<0.5	<4.4
92-06	NBD-555	04/26/1994	No Data	~31.4	<1.0	<2	No Data	7.73	<0.09	1.86	<4.0
	NBD-159	10/06/1994	No Data	~69.3	~1.5	<2	No Data	7.06	<0.5	0.74	<4.6
92-07	NBB-580	05/10/1994	No Data	1200	<1.0	10.6	No Data	6.83	<0.12	<0.04	<1.6
	NBD-163	10/10/1994	No Data	952	<1.0	3.6	No Data	6.26	<0.5	<0.5	<1.7
92-08	NBD-573	05/09/1994	No Data	1140	<1.0	6.87	No Data	6.88	<0.10	<0.07	<1.5
	NBD-162	10/07/1994	No Data	~152	<1.0	4.31	No Data	6.65	<0.5	<0.5	<1.4
92-09	NBD-575	05/10/1994	No Data	~17.5	<1.0	<2	No Data	7.06	<0.12	<0.02	<1.8
	NBD-156	10/05/1994	No Data	~93.1	<1.0	<2	No Data	6.60	<0.5	<0.5	<3.2
	NBD-157	10/05/1994	No Data	~74.4	<1.0	<2	No Data	No Data	<0.5	<0.5	<3.1
92-10	NBD-574	05/09/1994	No Data	~14.8	3.4	<2	No Data	7.54	<0.11	1.13	<2.2
	NBD-155	10/05/1994	No Data	~47.3	~1.4	<2	No Data	6.84	<0.5	1.25	4.5
92-11	NBD-562	05/03/1994	No Data	1240	<1.0	12.9	No Data	6.79	<0.13	<0.06	<1.6
	NBD-563	05/03/1994	No Data	1240	<1.0	8.91	No Data	No Data	0.23	<0.04	<1.0
	NBD-160	10/06/1994	No Data	737	<1.0	36.8	No Data	6.41	<0.5	<0.5	<2.3
92-12	NBD-564	05/03/1994	No Data	1030	3.3	<2	No Data	7.48	<0.13	0.24	<2.0
	NBD-669	10/12/1994	No Data	1100	8.6	No Data	No Data	7.60	No Data	No Data	No Data
92-13	NBD-556	05/02/1994	No Data	~28.5	~1.3	<2	No Data	10.99	<0.15	0.18	<1.9
	NBD-671	10/12/1994	No Data	~71.3	5.8	<2	No Data	9.80	<0.5	<0.5	<1.0
93-01	NBD-570	05/06/1994	No Data	~16.5	<1.0	<2	No Data	7.49	<0.11	0.88	<2.4
	NBD-168	10/12/1994	No Data	~25.7	<1.0	<2	No Data	6.96	<0.5	0.74	<5.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b](Nitrate + nitrite) as nitrogen. The samples were acidified in the field, thus the nitrite was oxidized to nitrate.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Rn-222 (pCi/L)[b]	Se (μg/L)	Semivolatile (μg/L)	SO_4[c] (mg/L)	TDS[d] (mg/L)	Temperature (degrees C)	Th-230 (pCi/L)[b]	Th-232 (pCi/L)[b]	Tl (μg/L)
31NE93-205	NBD-550	05/11/1994	134	~1.3	No Data	451	964	13.8	<0.18	<0.20	<1.0
	NBD-167	10/11/1994	116	<2.0	No Data	457	970	14.2	0.34	<0.3	<1.0
31SW91-03	NBD-569	05/05/1994	873	16.3	See Table	948	2090	11.0	<0.09	<0.09	<1.0
	NBD-174	10/13/1994	902	16.6	No Data	1010	2090	11.1	0.34	<0.3	<1.0
31SW91-14	NBD-565	05/04/1994	924	12.0	See Table	1330	2710	10.9	<2.69	<2.02	<1.0
	NBD-172	10/13/1994	1201	11.9	No Data	1450	2810	10.9	0.86	<0.3	<1.0
31SW91-23	NBD-567	05/05/1994	164	19.1	No Data	2020	3810	9.6	<0.82	<0.48	<1.0
	NBD-170	10/13/1994	267	19.5	No Data	2120	3780	13.7	<0.3	<0.3	<1.0
36SE93-201-2	NBD-544	05/05/1994	1035	144	No Data	1720	5170	9.3	1.06	<0.08	<1.0
	NBD-672	10/12/1994	183	66.0	No Data	2020	5600	13.4	2.17	0.97	<1.0
82-07	NBB-579	05/10/1994	842	21.6	No Data	882	1950	8.4	<1.29	<1.57	<1.0
	NBD-164	10/10/1994	1023	31.1	No Data	867	1940	12.9	<0.3	<0.3	<1.0
82-30B	NBD-568	05/05/1994	2670	15.6	See Table	599	1460	9.4	<0.57	<0.49	<1.0
	NBD-173	10/13/1994	3789	18.3	No Data	635	1500	10.4	2.49	1.21	<1.0
82-31B-E	NBB-578	05/09/1994	639	~2.9	No Data	1410	2660	9.3	<0.13	<0.13	<1.0
	NBD-169	10/12/1994	1156	<2.0	No Data	1770	3180	14.1	<0.3	<0.3	<1.0
82-40A	NBD-566	05/04/1994	176	~1.8	No Data	1110	2350	10.3	<1.54	<1.36	<1.0
	NBD-673	10/13/1994	78509	<2.0	No Data	1630	3480	10.8	0.64	<0.3	<1.0
	NBD-674	10/13/1994	74650	<2.0	No Data	1640	3400	No Data	0.74	0.34	<1.0
82-42	NBD-571	05/09/1994	1282	~3.9	No Data	485	1210	9.9	<0.14	<0.10	~1.1
	NBD-572	05/09/1994	1374	~4.5	No Data	487	1210	No Data	<0.16	<0.17	<1.0
	NBD-171	10/13/1994	1506	~2.6	No Data	645	1320	9.8	<0.3	<0.3	<1.0
83-70	NBD-548	05/10/1994	315	~1.0	No Data	99.3	~450	11.5	<0.12	<0.13	<1.0
	NBD-165	10/11/1994	312	<2.0	No Data	103	606	11.6	<0.3	<0.3	<1.0
88-85	NBD-561	05/03/1994	2964	18.2	See Table	825	1970	9.7	<0.67	<0.64	<1.0
	NBD-161	10/06/1994	2025	19.8	No Data	827	1900	12.4	<0.3	<0.3	<1.0
92-01	NBD-559	05/02/1994	792	~4.0	No Data	1060	1940	8.3	<0.12	<0.11	<1.0
	NBD-154	10/04/1994	733	~3.5	No Data	1170	2280	9.7	<0.3	<0.3	<1.0
92-02	NBD-560	05/03/1994	<79	<1.0	No Data	48.2	~326	10.3	<0.12	<0.11	<1.0
	NBD-151	10/03/1994	122	<2.0	No Data	49.7	~368	10.4	<0.3	<0.3	<1.0
92-03	NBD-554	04/26/1994	743	~1.5	No Data	136	~476	6.9	<0.06	<0.05	<1.0
	NBD-153	10/04/1994	1054	<2.0	No Data	221	632	13.6	<0.3	<0.3	<1.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated). "See Table" indicates that the reader should refer to Table A-20 for a list of detected constituents.

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Rn-222 (pCi/L)[b]	Se (μg/L)	Semivolatile (μg/L)	SO_4[c] (mg/L)	TDS[d] (mg/L)	Temperature (degrees C)	Th-230 (pCi/L)[b]	Th-232 (pCi/L)[b]	Tl (μg/L)
92-04	NBD-553	04/26/1994	<85	~1.0	No Data	111	~430	10.4	<0.07	<0.05	<1.0
	NBD-152	10/04/1994	94	<2.0	No Data	112	564	11.2	<0.3	<0.3	~1.1
92-05	NBD-557	05/02/1994	789	~3.1	See Table	695	1350	7.4	<0.05	<0.06	<1.0
	NBD-158	10/05/1994	572	<2.0	No Data	555	1160	9.3	<0.3	<0.3	<1.0
92-06	NBD-555	04/26/1994	<83	~1.2	No Data	88.1	~382	9.8	<0.12	<0.12	<1.0
	NBD-159	10/06/1994	65	<2.0	No Data	93.4	~358	10.0	<0.3	<0.3	<1.0
92-07	NBB-580	05/10/1994	1135	6.8	No Data	800	1810	9.4	<1.24	<1.23	<1.0
	NBD-163	10/10/1994	1060	7.0	No Data	792	1770	14.9	0.55	<0.3	<1.0
92-08	NBD-573	05/09/1994	1136	18.8	No Data	765	1690	6.6	<0.46	<0.44	<1.0
	NBD-162	10/07/1994	1192	11.0	No Data	730	1500	11.1	1.44	0.97	<1.0
92-09	NBD-575	05/10/1994	425	~1.2	No Data	917	1980	7.9	<0.24	<0.15	<1.0
	NBD-156	10/05/1994	358	<2.0	No Data	881	1920	12.2	<0.3	<0.3	<1.0
	NBD-157	10/05/1994	369	<2.0	No Data	894	1910	No Data	0.73	0.42	<1.0
92-10	NBD-574	05/09/1994	129	~1.3	No Data	139	512	9.6	<0.08	<0.07	<1.0
	NBD-155	10/05/1994	159	<2.0	No Data	148	580	9.7	<0.3	<0.3	<1.0
92-11	NBD-562	05/03/1994	1147	6.6	No Data	820	1820	9.4	<1.32	<1.04	<1.0
	NBD-563	05/03/1994	990	6.9	No Data	820	1840	No Data	<0.88	<0.75	<1.0
	NBD-160	10/06/1994	1025	9.1	No Data	858	1870	13.0	0.58	0.56	<1.0
92-12	NBD-564	05/03/1994	<78	~3.9	No Data	126	894	9.7	<0.14	<0.14	<1.0
	NBD-669	10/12/1994	<78	~2.5	No Data	126	914	10.8	<0.3	<0.3	<1.0
92-13	NBD-556	05/02/1994	253	~2.3	No Data	51.6	634	9.7	<0.07	<0.05	<1.0
	NBD-671	10/12/1994	92	<2.0	No Data	59.6	692	10.1	<0.3	<0.3	<1.0
93-01	NBD-570	05/06/1994	108	<1.0	No Data	95.0	~440	10.1	<0.16	<0.16	<1.0
	NBD-168	10/12/1994	122	<2.0	No Data	102	~468	10.3	<0.3	<0.3	<1.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated). "See Table" indicates that the reader should refer to Table A-20 for a list of detected constituents.

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]For this analyte, one or more samples were measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d]Total dissolved solids.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Turbidity (NTU)[b]	U (μg/L)	U-234 (pCi/L)[c]	U-235 (pCi/L)[c]	U-238 (pCi/L)[c]	V (μg/L)	Volatile (μg/L)	Zn (μg/L)
31NE93-205	NBD-550	05/11/1994	0.95	<1.0	2.34	<0.11	<0.10	<5.0	No Data	~12.8
	NBD-167	10/11/1994	0.47	<1.0	1.89	<0.3	<0.3	<6.0	No Data	<2.0
31SW91-03	NBD-569	05/05/1994	4.44	1520	538.25	31.41	559.67	1340	No Detect	~13.9
	NBD-174	10/13/1994	2.10	1410	416.09	21.41	426.34	1270	No Data	<2.0
31SW91-14	NBD-565	05/04/1994	0.79	3210	1119.57	46.60	1130.05	938	No Detect	~5.3
	NBD-172	10/13/1994	2.93	3150	1058.43	45.38	1072.89	869	No Data	<2.0
31SW91-23	NBD-567	05/05/1994	2.41	1370	498.42	26.91	497.31	<5.0	No Data	~8.4
	NBD-170	10/13/1994	0.62	1160	420.14	22.95	462.09	<6.0	No Data	~6.2
36SE93-201-2	NBD-544	05/05/1994	>1000	4850	1740.33	72.15	1796.32	87800	No Data	68.7
	NBD-672	10/12/1994	No Data	6860	2177.07	92.54	2239.99	126000	No Data	42.3
82-07	NBB-579	05/10/1994	1.31	376	142.13	5.44	142.52	65.8	No Data	~7.4
	NBD-164	10/10/1994	1.00	396	134.34	5.40	145.38	82.2	No Data	~7.5
82-30B	NBD-568	05/05/1994	0.45	974	340.73	24.14	351.26	2380	No Detect	~6.2
	NBD-173	10/13/1994	0.68	900	320.86	13.09	321.95	2390	No Data	<2.0
82-31B-E	NBB-578	05/09/1994	0.59	25.6	17.44	<0.11	8.63	<5.0	No Data	~6.0
	NBD-169	10/12/1994	1.01	23.6	23.86	0.57	9.03	<6.0	No Data	~3.7
82-40A	NBD-566	05/04/1994	2.15	5400	1822.27	81.17	1826.50	68.6	No Data	~4.9
	NBD-673	10/13/1994	0.98	10900	3131.09	147.32	3199.75	64.5	No Data	~3.3
	NBD-674	10/13/1994	No Data	10200	2841.74	123.80	2879.47	67.8	No Data	~2.7
82-42	NBD-571	05/09/1994	2.88	42.5	16.95	0.63	14.53	218	No Data	~6.2
	NBD-572	05/09/1994	No Data	41.8	16.81	0.57	14.40	215	No Data	~2.8
	NBD-171	10/13/1994	1.22	37.1	15.41	0.59	14.13	186	No Data	<2.0
83-70	NBD-548	05/10/1994	1.04	~4.3	<0.22	<0.11	<0.12	<5.0	No Data	~5.6
	NBD-165	10/11/1994	0.41	<1.0	1.14	<0.3	0.47	<6.0	No Data	<2.0
88-85	NBD-561	05/03/1994	3.56	514	182.29	13.93	186.44	429	No Detect	~8.4
	NBD-161	10/06/1994	3.94	460	150.30	7.42	147.92	428	No Data	~2.9
92-01	NBD-559	05/02/1994	2.14	5.3	4.97	<0.19	3.11	<5.0	No Data	~2.4
	NBD-154	10/04/1994	4.84	6.0	5.39	0.42	3.09	<6.0	No Data	~5.7
92-02	NBD-560	05/03/1994	0.31	<1.0	2.37	<0.14	<0.15	<5.0	No Data	<2.0
	NBD-151	10/03/1994	1.20	<1.0	1.05	<0.3	<0.3	<6.0	No Data	<2.0
92-03	NBD-554	04/26/1994	652	~2.9	2.73	<0.08	1.19	<5.0	No Data	~8.9
	NBD-153	10/04/1994	3.72	~3.3	2.53	<0.3	1.21	<6.0	No Data	~2.9

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Nephelometric turbidity units. A ">" indicates that the minimum turbidity was above the quantification limit of the field instrument.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-19 (continued). Groundwater Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Turbidity (NTU)[b]	U (µg/L)	U-234 (pCi/L)[c]	U-235 (pCi/L)[c]	U-238 (pCi/L)[c]	V (µg/L)	Volatile (µg/L)	Zn (µg/L)
92-04	NBD-553	04/26/1994	0.97	<1.0	4.42	0.25	0.63	<5.0	No Data	~5.6
	NBD-152	10/04/1994	1.36	<1.0	4.95	<0.3	<0.3	<6.0	No Data	~4.3
92-05	NBD-557	05/02/1994	3.52	5.7	4.17	<0.07	1.81	<5.0	No Detect	~10.7
	NBD-158	10/05/1994	3.10	5.8	3.90	<0.3	2.07	<6.0	No Data	~15.6
92-06	NBD-555	04/26/1994	0.64	<1.0	<0.10	<0.04	<0.05	<5.0	No Data	~4.5
	NBD-159	10/06/1994	1.13	<1.0	0. 120	11	<0.3	<6.0	No Data	<2.0
92-07	NBB-580	05/10/1994	0.55	1280	399.73	18.58	420.15	441	No Data	~4.6
	NBD-163	10/10/1994	0.39	942	329.97	13.83	334.92	435	No Data	<2.0
92-08	NBD-573	05/09/1994	1.08	647	226.91	8.42	214.87	<5.0	No Data	~2.2
	NBD-162	10/07/1994	0.33	459	168.99	6.62	172.17	<6.0	No Data	<2.0
92-09	NBD-575	05/10/1994	0.53	306	109.66	3.94	102.17	<5.0	No Data	~4.9
	NBD-156	10/05/1994	1.01	291	107.14	4.73	103.51	<6.0	No Data	~3.0
	NBD-157	10/05/1994	No Data	282	101.37	4.30	97.54	<6.0	No Data	~8.9
92-10	NBD-574	05/09/1994	23.1	~2.3	1.69	<0.08	<0.07	<5.0	No Data	~4.0
	NBD-155	10/05/1994	2.48	<1.0	1.15	<0.3	<0.3	<6.0	No Data	~8.6
92-11	NBD-562	05/03/1994	4.83	1500	507.78	22.83	514.95	907	No Data	~4.2
	NBD-563	05/03/1994	No Data	1430	492.25	30.06	504.59	892	No Data	~3.4
	NBD-160	10/06/1994	1.79	1560	461.54	21.77	458.30	963	No Data	~4.0
92-12	NBD-564	05/03/1994	85	10.8	7.65	<0.08	2.30	<5.0	No Data	~6.8
	NBD-669	10/12/1994	>1000	6.1	6.40	<0.3	2.29	<6.0	No Data	32.6
92-13	NBD-556	05/02/1994	>1000	~2.5	3.74	<0.08	1.63	~20.5	No Data	~2.5
	NBD-671	10/12/1994	No Data	~4.5	4.83	<0.3	2.11	~18.9	No Data	~16.1
93-01	NBD-570	05/06/1994	0.49	13.7	1.94	<0.06	<0.08	<5.0	No Data	~2.6
	NBD-168	10/12/1994	No Data	<1.0	1.91	<0.3	<0.3	<6.0	No Data	<2.0

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Nephelometric turbidity units. A ">" indicates that the minimum turbidity was above the quantification limit of the field instrument.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table A-20. Organic Constituents Detected in Samples Collected from Groundwater At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Analyte Name	CAS Number[b]	Concentration (µg/L)	Category	TCL Constituent[c]
Ground Water							
31SW91-03	NBD-569	05/05/1994	bis(2-ethylhexyl)Phthalate	117-81-7	21	Semivolatile	X
31SW91-14	NBD-565	05/04/1994	1,1'-sulfonylbis[4-chloro-Benzene]	80-07-9	~8	Semivolatile	
			bis(2-ethylhexyl)Phthalate	117-81-7	~3	Semivolatile	X
			Phosphine oxide, triphenyl-	791-28-6	~10	Semivolatile	
82-30B	NBD-568	05/05/1994	1,1'-sulfonylbis[4-chloro-Benzene]	80-07-9	~7	Semivolatile	
			bis(2-ethylhexyl)Phthalate	117-81-7	~2	Semivolatile	X
			Phosphine oxide, triphenyl-	791-28-6	~7	Semivolatile	
88-85	NBD-561	05/03/1994	1,1'-sulfonylbis[4-chloro-Benzene]	80-07-9	~7	Semivolatile	
			bis(2-ethylhexyl)Phthalate	117-81-7	~3	Semivolatile	X
			Dodecanoic acid	143-07-7	~5	Semivolatile	
			Phosphine oxide, triphenyl-	791-28-6	~4	Semivolatile	
			Tetradecanoic acid	544-63-8	~3	Semivolatile	
			Unknown Organic Acid	UNK-22.69a	~3	Semivolatile	
92-05	NBD-557	05/02/1994	bis(2-ethylhexyl)Phthalate	117-81-7	~6	Semivolatile	X
			di-n-butylphthalate	84-74-2	~1	Semivolatile	X
QA/QC							
Trip Blank	NBD-558	05/02/1994	Chloroform	67-66-3	1.3	Volatile	X

[a]A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]CAS numbers are not assigned to unknown analytes; identifiers listed in this column for unknown analytes reflect the peak and range as displayed graphically by the mass spectrometer.

[c]Constituents not identified by an "X" are tentatively identified compounds.

Table 21. QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ag (µg/L)	Ag[b] (µg/L)	Al (µg/L)	Al[b] (µg/L)	Alpha[c] (pCi/L)	As (µg/L)	As[b] (µg/L)	B (µg/L)	B[b] (µg/L)
Equipment Blank	NBD-541	05/05/1994	<4.0	No Data	~45.7	No Data	<7.9	~2.1	No Data	~11.6	No Data
	NBD-549	05/10/1994	<4.0	No Data	~15.0	No Data	<3.8	~2.5	No Data	<7.0	No Data
	NBD-166	10/11/1994	No Data	<1.0	No Data	~25.3	<5.2	No Data	<2.0	No Data	<2.0
	NBD-665	10/11/1994	<1.0	<1.0	<10.0	<10.0	<5.2	<2.0	<2.0	<2.0	<2.0
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Ba (μg/L)	Ba[b] (μg/L)	Beta[c] (pCi/L)	Ca[d] (mg/L)	Cd (μg/L)	Cd[b] (μg/L)	Cl[d] (mg/L)	Cr (μg/L)	Cr[b] (μg/L)
Equipment Blank	NBD-541	05/05/1994	<4.0	No Data	<12.2	~0.028	<1.0	No Data	~0.07	<4.0	No Data
	NBD-549	05/10/1994	<4.0	No Data	<6.1	~0.13	<1.0	No Data	<0.01	<4.0	No Data
	NBD-166	10/11/1994	No Data	<3.0	<6.6	~.0254	No Data	<1.0	7.81	No Data	<2.0
	NBD-665	10/11/1994	<3.0	<3.0	<6.6	~.026	<1.0	<1.0	~.0348	<2.0	<2.0
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[d]For this analyte, one or more samples was measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Cu (µg/L)	Cu[b] (µg/L)	F (µg/L)	Fe (µg/L)	Fe[b] (µg/L)	K[c] (mg/L)	Mg[c] (mg/L)	Mn (µg/L)	Mn[b] (µg/L)
Equipment Blank	NBD-541	05/05/1994	<2.0	No Data	<7.0	~59.1	No Data	<0.74	<0.06	<1.0	No Data
	NBD-549	05/10/1994	<2.0	No Data	~44.0	~9.1	No Data	<0.74	<0.06	<1.0	No Data
	NBD-166	10/11/1994	No Data	<4.0	~199	No Data	~58.5	<.672	<.063	No Data	~1.2
	NBD-665	10/11/1994	<4.0	<4.0	<51.0	<6.0	<6.0	<.672	<.063	<1.0	<1.0
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples was measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Mo (µg/L)	Mo[b] (µg/L)	Na[c] (mg/L)	NH_4 (µg/L)	Ni (µg/L)	Ni[b] (µg/L)	NO_3+NO_2-N[d] (µg/L)	Pb (µg/L)	Pb[b] (µg/L)
Equipment Blank	NBD-541	05/05/1994	<27.0	No Data	~0.03	21.3	<6.0	No Data	~20.1	<1.0	No Data
	NBD-549	05/10/1994	<27.0	No Data	~0.05	~12.7	<6.0	No Data	~11.7	~1.2	No Data
	NBD-166	10/11/1994	No Data	<1.0	~.0761	233	No Data	<8.0	~30.4	No Data	<1.0
	NBD-665	10/11/1994	<1.0	<1.0	~.124	<13.0	<8.0	<8.0	~36.9	<1.0	<1.0
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]Sample was filtered in the field.

[c]For this analyte, one or more samples was measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[d](Nitrate + nitrite) as nitrogen. The samples were acidified in the field, thus the nitrite was oxidized to nitrate.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Pb-210 (pCi/L)[b]	Po-210 (pCi/L)[b]	Ra-226 (pCi/L)[b]	Ra-228 (pCi/L)[b]	Rn-222 (pCi/L)[b]	Se (µg/L)	Se[c] (µg/L)	SO_4[d] (mg/L)	TDS[e] (mg/L)
Equipment Blank	NBD-541	05/05/1994	<2	<0.10	<0.07	<1.1	<53	~1.2	No Data	0.26	~124
	NBD-549	05/10/1994	<2	<0.10	<0.15	<1.4	<38	~1.7	No Data	<0.09	~96.0
	NBD-166	10/11/1994	<2	<0.5	<0.5	<2.2	<81	No Data	<2.0	113	~106
	NBD-665	10/11/1994	<2	<0.5	<0.5	<1.4	<77	<2.0	<2.0	~.0821	~182
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]Sample was filtered in the field.

[d]For this analyte, one or more samples was measured in micrograms per liter by the Analytical Chemistry Laboratory; the results were converted to milligrams per liter for comparison purposes.

[e]Total dissolved solids.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	Th-230 (pCi/L)[b]	Th-232 (pCi/L)[b]	Tl (μg/L)	Tl[c] (μg/L)	U (μg/L)	U[c] (μg/L)	U-234 (pCi/L)[b]	U-235 (pCi/L)[b]	U-238 (pCi/L)[b]
Equipment Blank	NBD-541	05/05/1994	<0.06	<0.06	<1.0	No Data	<1.0	No Data	1.09	<0.05	0.60
	NBD-549	05/10/1994	<0.15	<0.10	<1.0	No Data	<1.0	No Data	<0.11	<0.08	<0.10
	NBD-166	10/11/1994	<0.3	<0.3	No Data	<1.0	No Data	<1.0	1.19	<0.3	1.11
	NBD-665	10/11/1994	<0.3	<0.3	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3	<0.3
Trip Blank	NBD-558	05/02/1994	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated).

[b]The values listed multiplied by 10^{-9} will result in microcuries per milliliter.

[c]Sample was filtered in the field.

Table 21 (continued). QA/QC Chemistry Data Collected At and Near MMTS during 1994[a]

Sample Location	Ticket Number	Sample Date	V (µg/L)	V[b] (µg/L)	Volatile (µg/L)	Zn (µg/L)	Zn[b] (µg/L)
Equipment Blank	NBD-541	05/05/1994	<5.0	No Data	No Data	~6.0	No Data
	NBD-549	05/10/1994	<5.0	No Data	No Data	~5.9	No Data
	NBD-166	10/11/1994	No Data	<6.0	No Data	No Data	~5.3
	NBD-665	10/11/1994	<6.0	<6.0	No Data	~7.3	<2.0
Trip Blank	NBD-558	05/02/1994	No Data	No Data	See Table	No Data	No Data

[a]A "<" indicates that the maximum concentration was below the detection limit (number shown is detection limit). A "~" indicates an approximate value (the value was outside the limits for which the instrument was calibrated). "See Table" indicates that the reader should refer to Table A-21 for a list of detected constituents.

[b]Sample was filtered in the field.

Appendix B

Time-Concentration Graphs

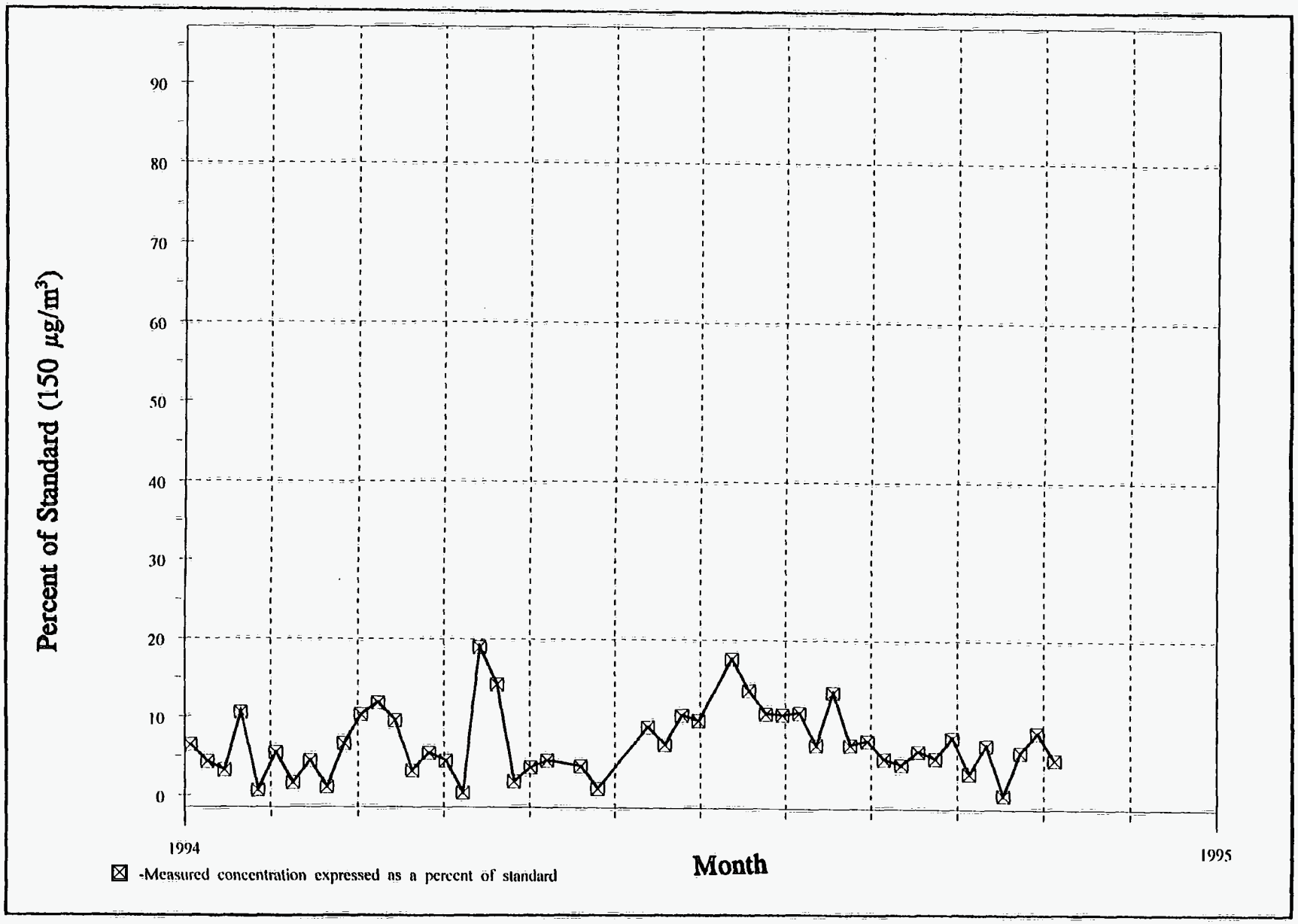

Figure B-1. PM_{10} Concentrations in Ambient Air as Percentage of EPA Standard at Station AIR-M-1 from January through November 1994

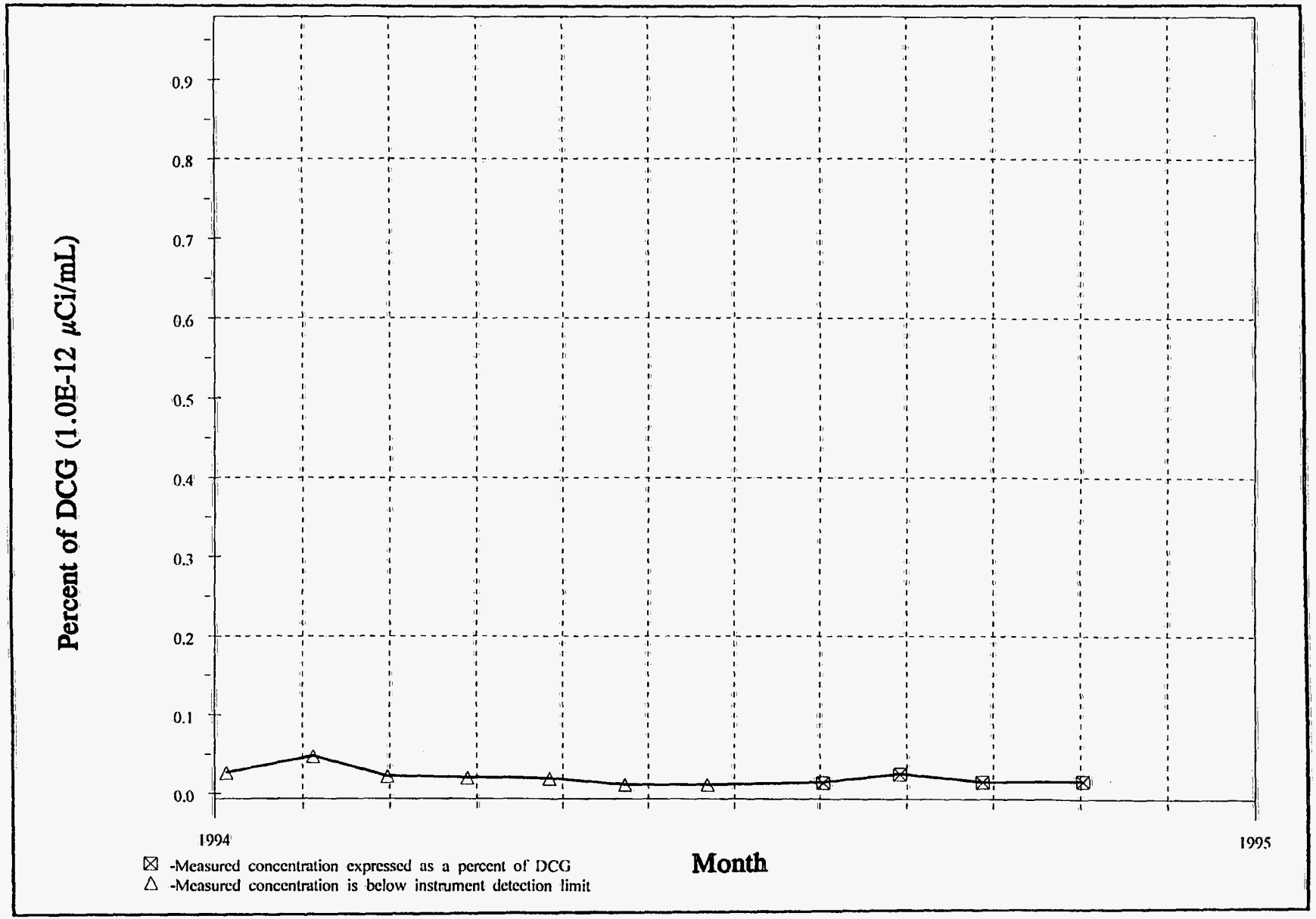

Figure B-2. Radium-226 Activities in Ambient Air as Percentage of DCG at Station R-M-3-AIR from January through November 1994

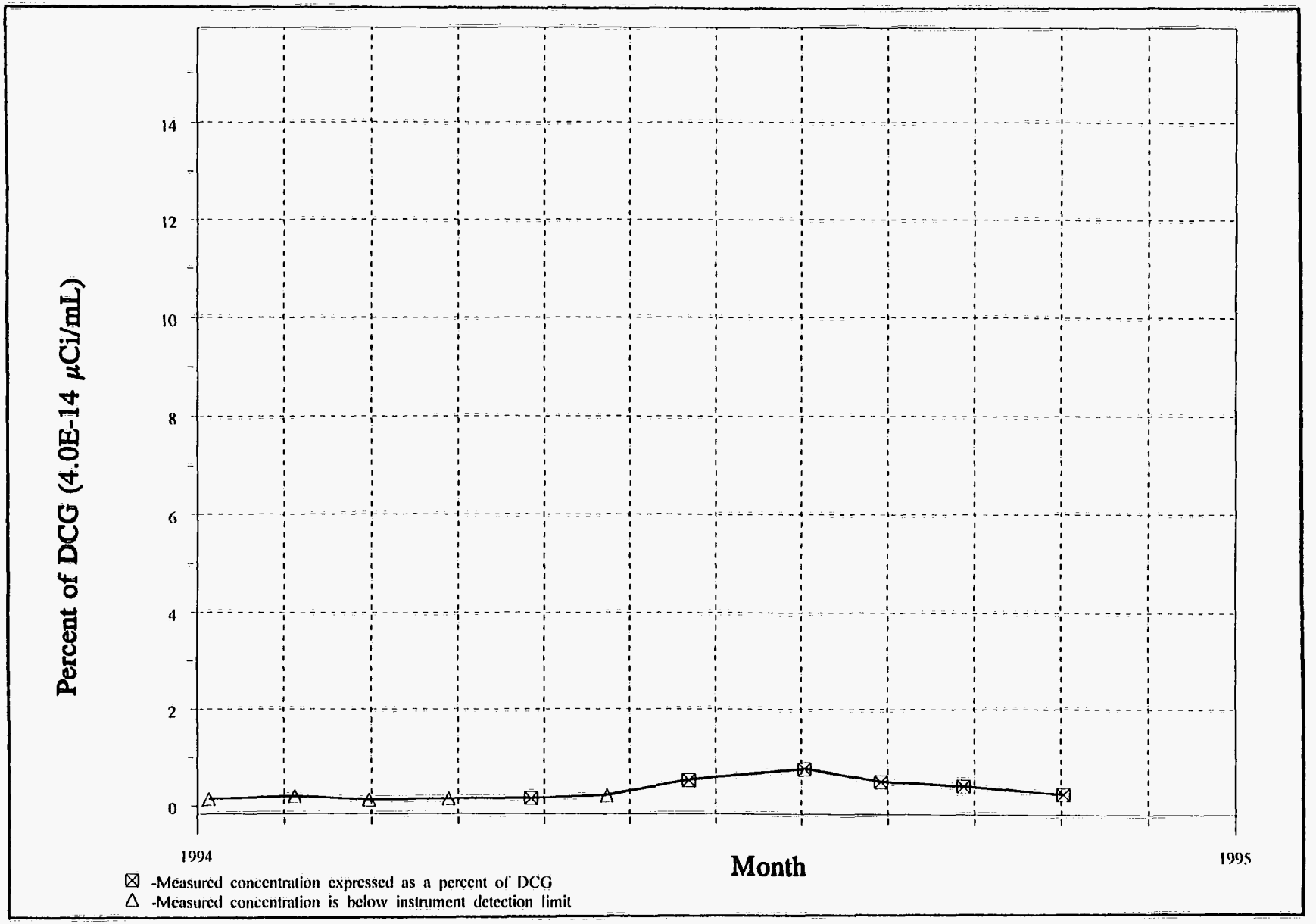

Figure B-3. Thorium-230 Activities in Ambient Air as Percentage of DCG at Station R-M-3-AIR from January through November 1994

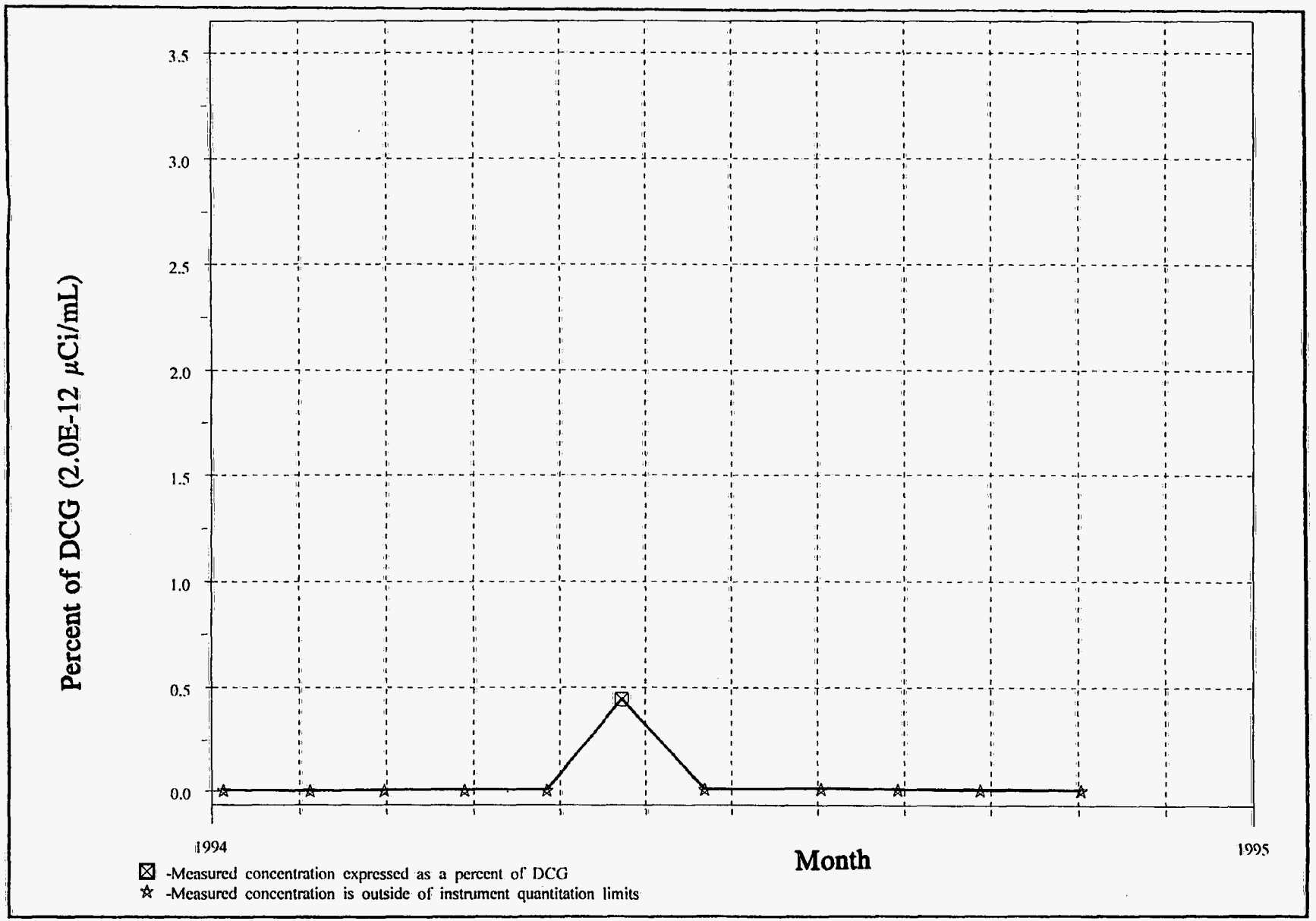

Figure B-4. Uranium Activities in Ambient Air as Percentage of DCG at Station R-M-3-AIR from January through November 1994

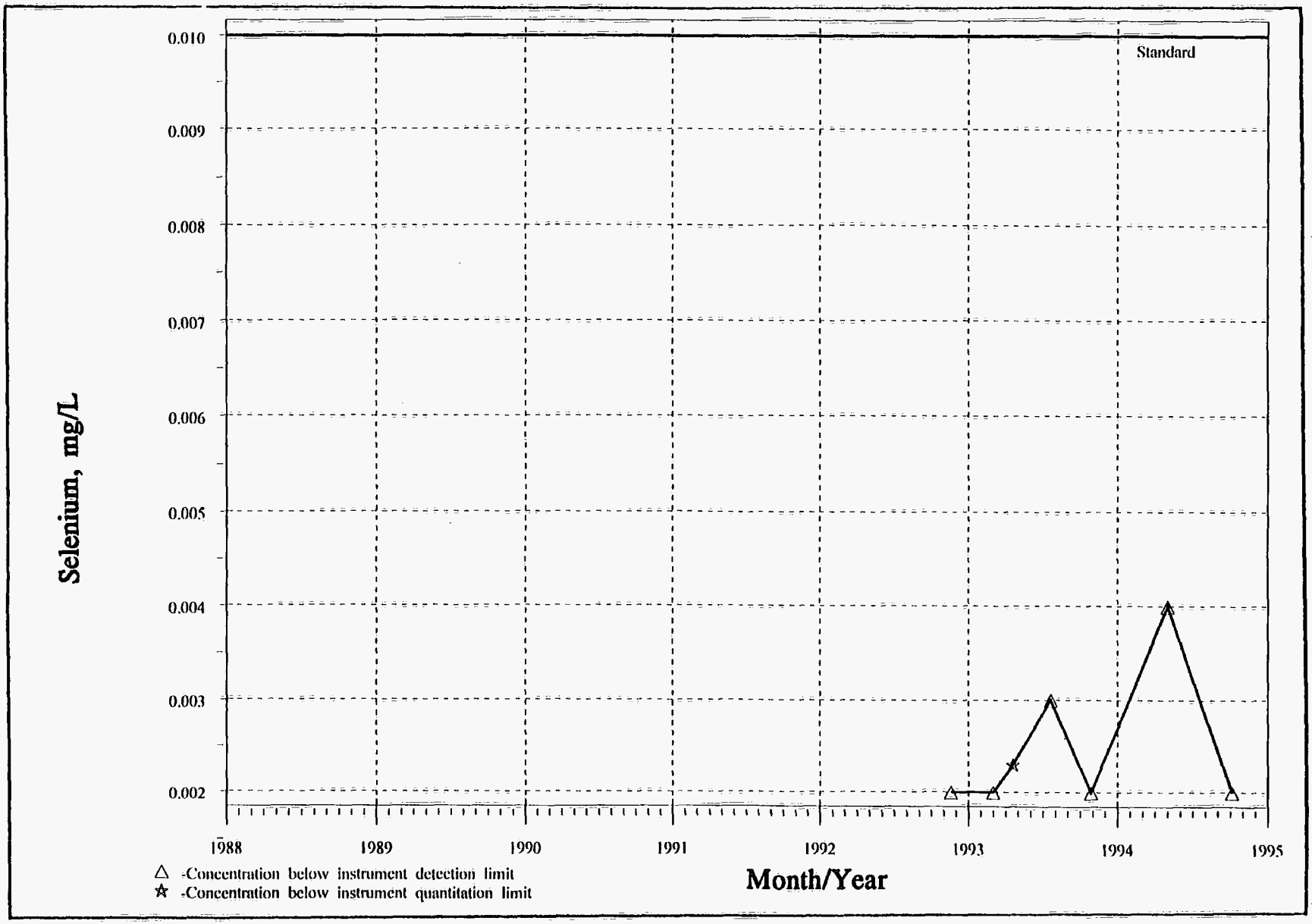

Figure B-5. Selenium Concentrations at SW92-02 (upstream) from November 1992 through October 1994

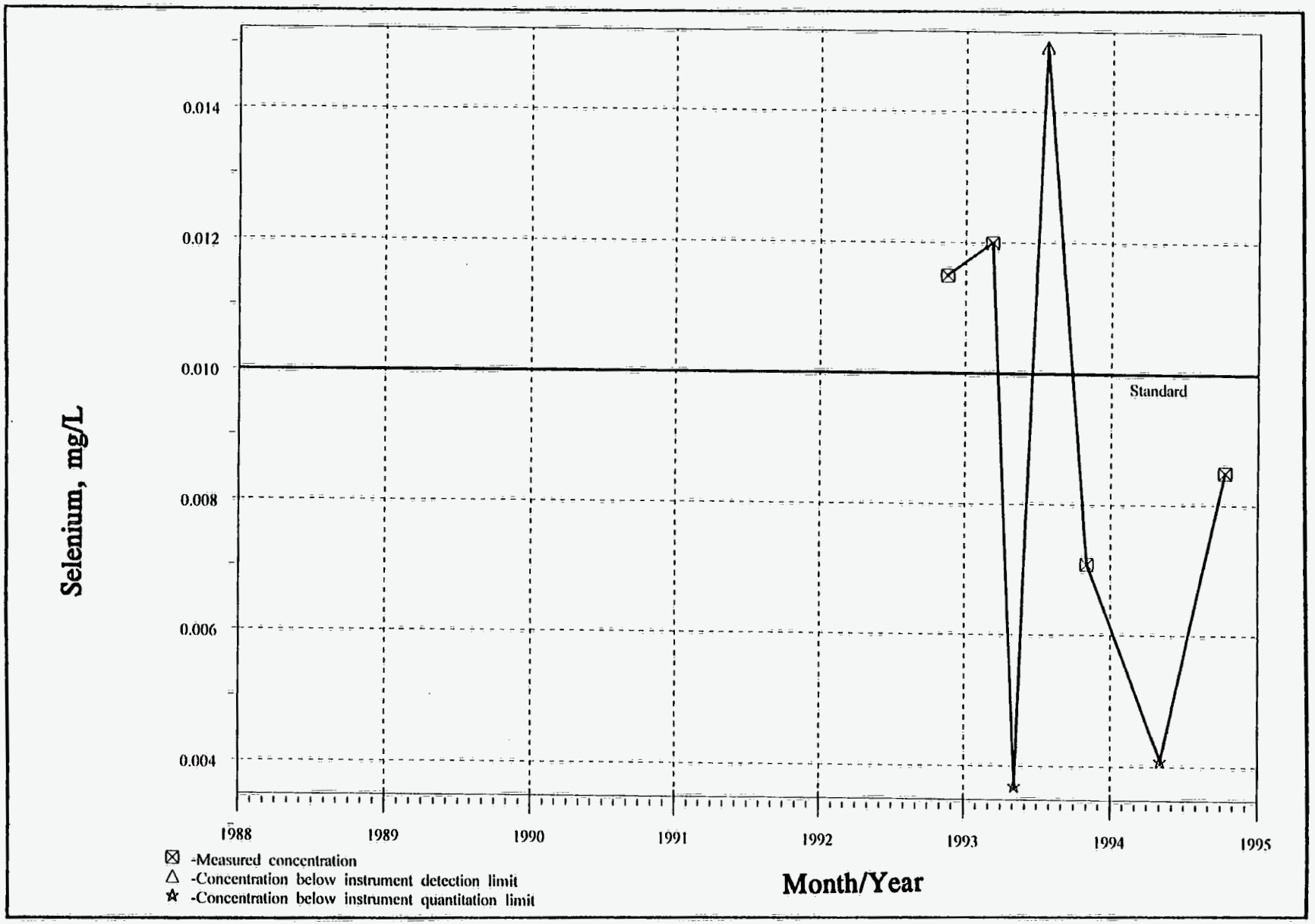

Figure B-6. Selenium Concentrations at SW92-04 (on site) from November 1992 through October 1994

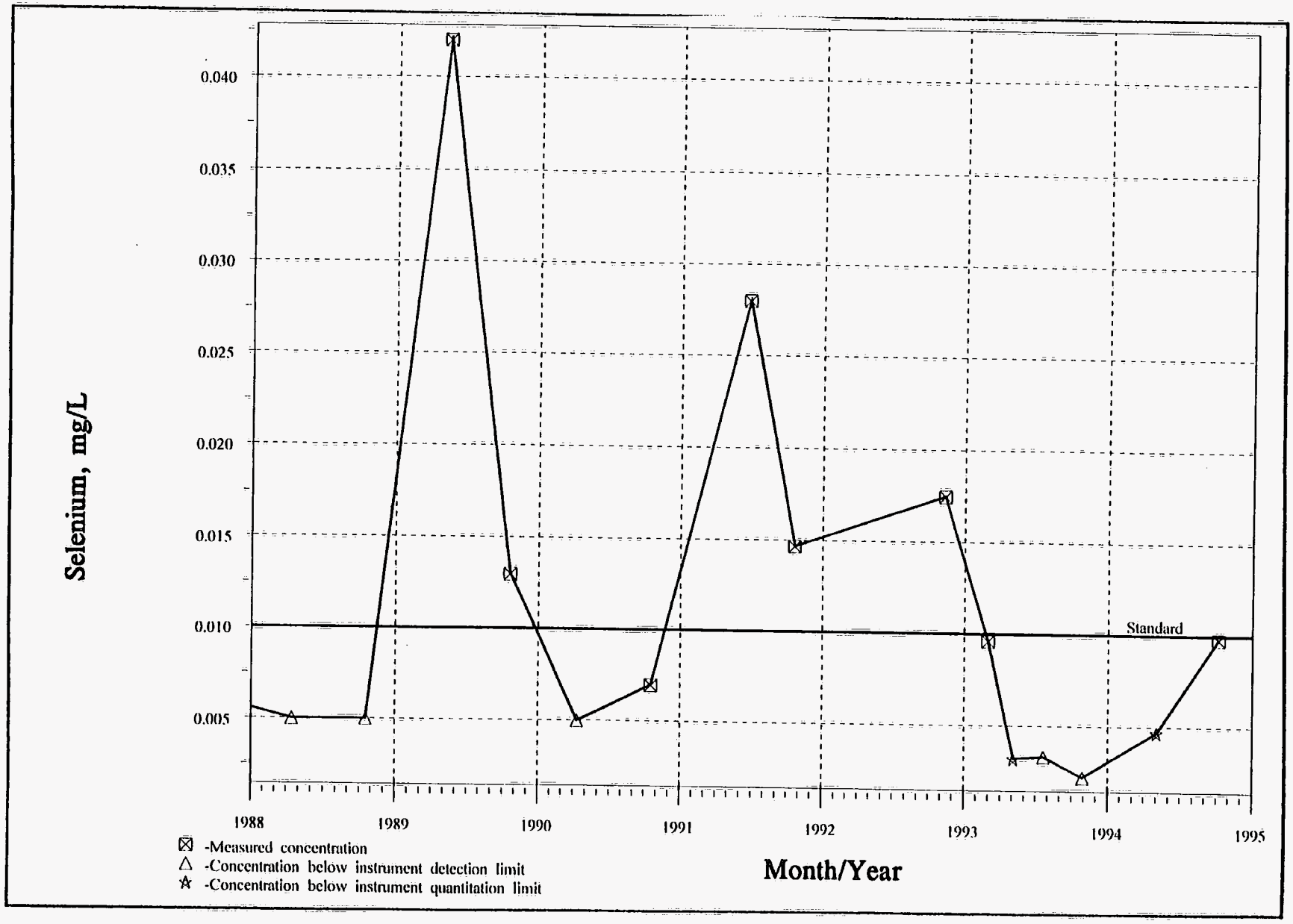

Figure B-7. Selenium Concentrations at W-4 (downstream) from January 1988 through October 1994

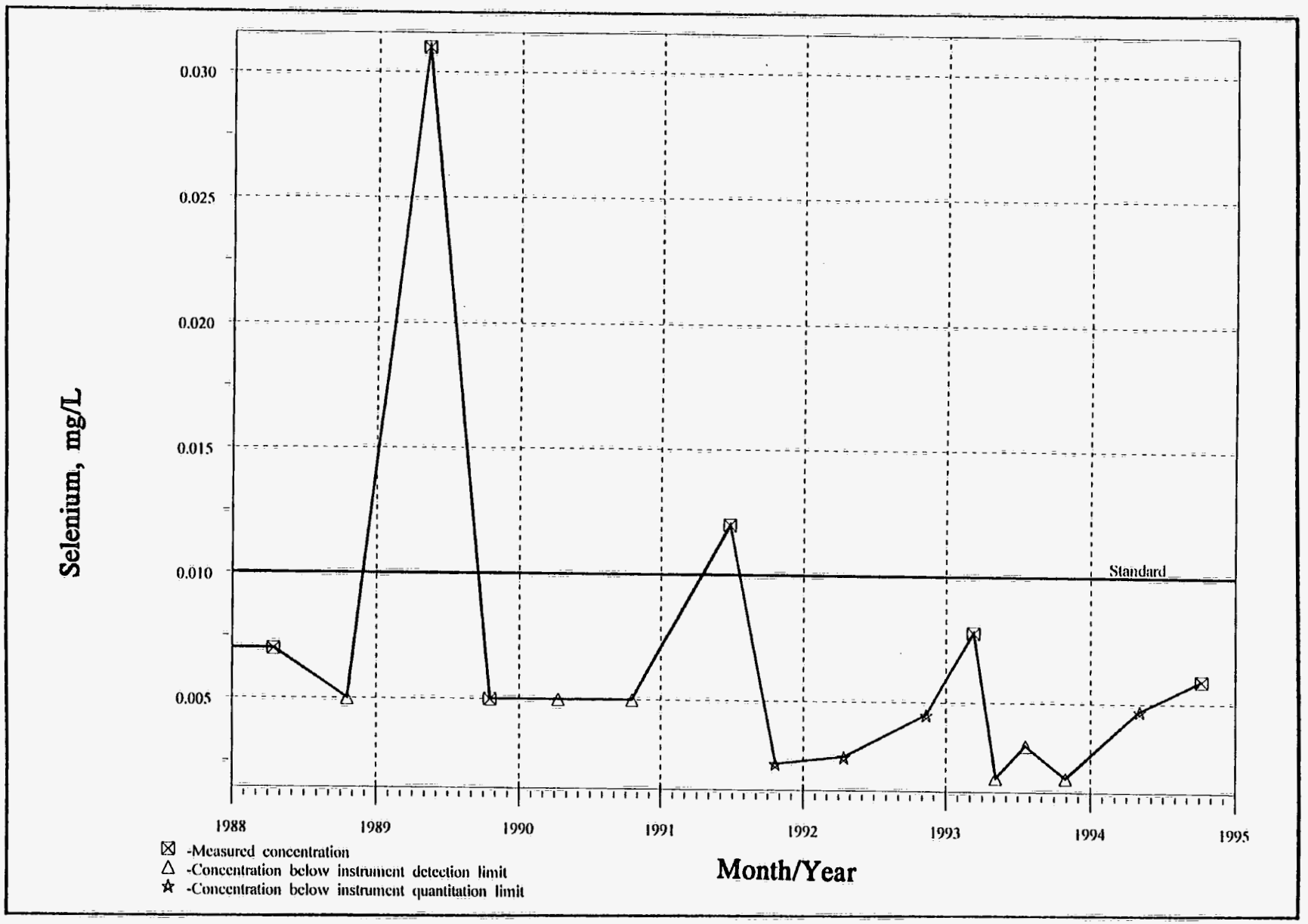

Figure B-8. Selenium Concentrations at Sorenson Site (downstream) from January 1988 through October 1994

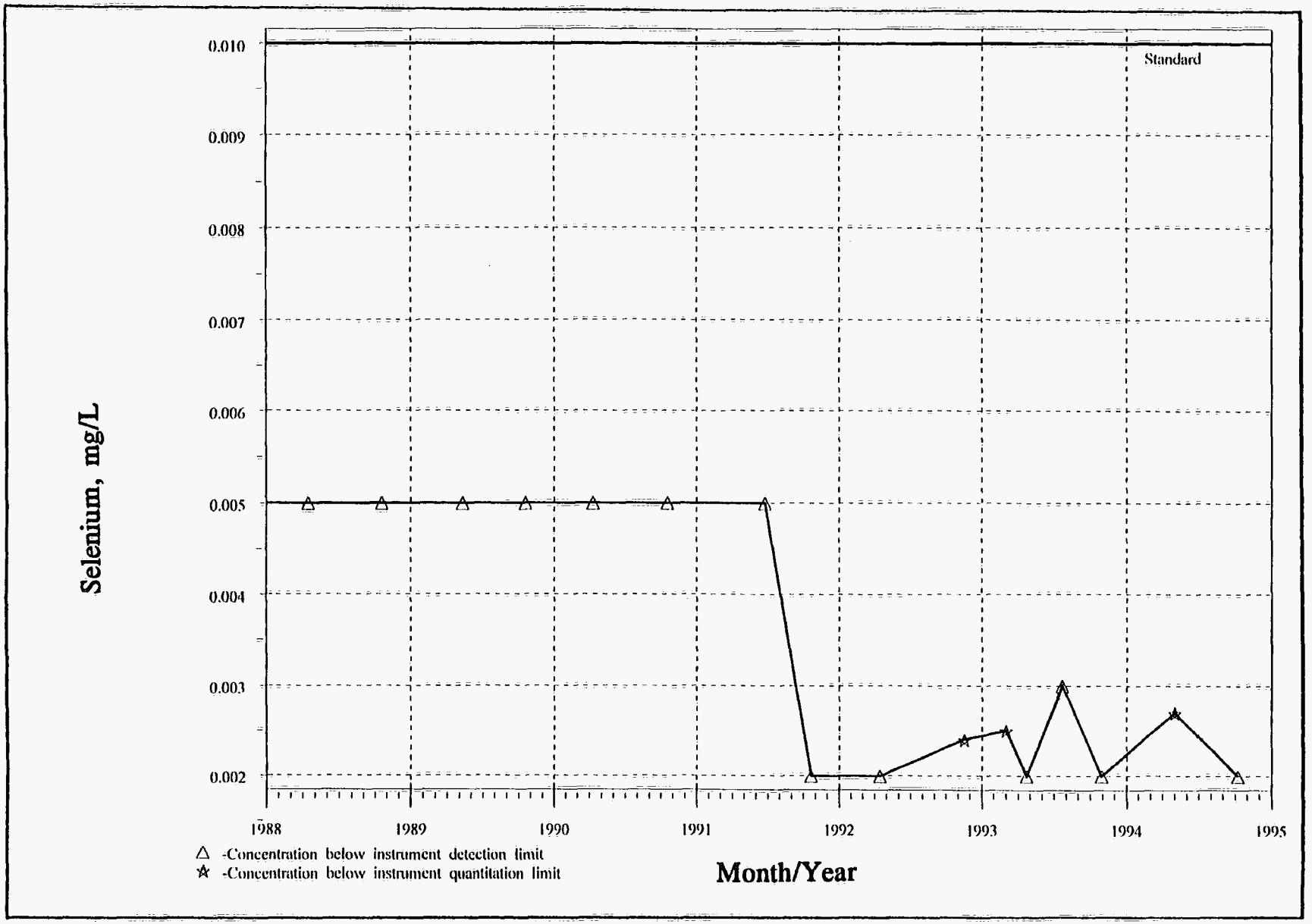

Figure B-9. Selenium Concentrations at Montezuma Canyon (downstream) from January 1988 through October 1994

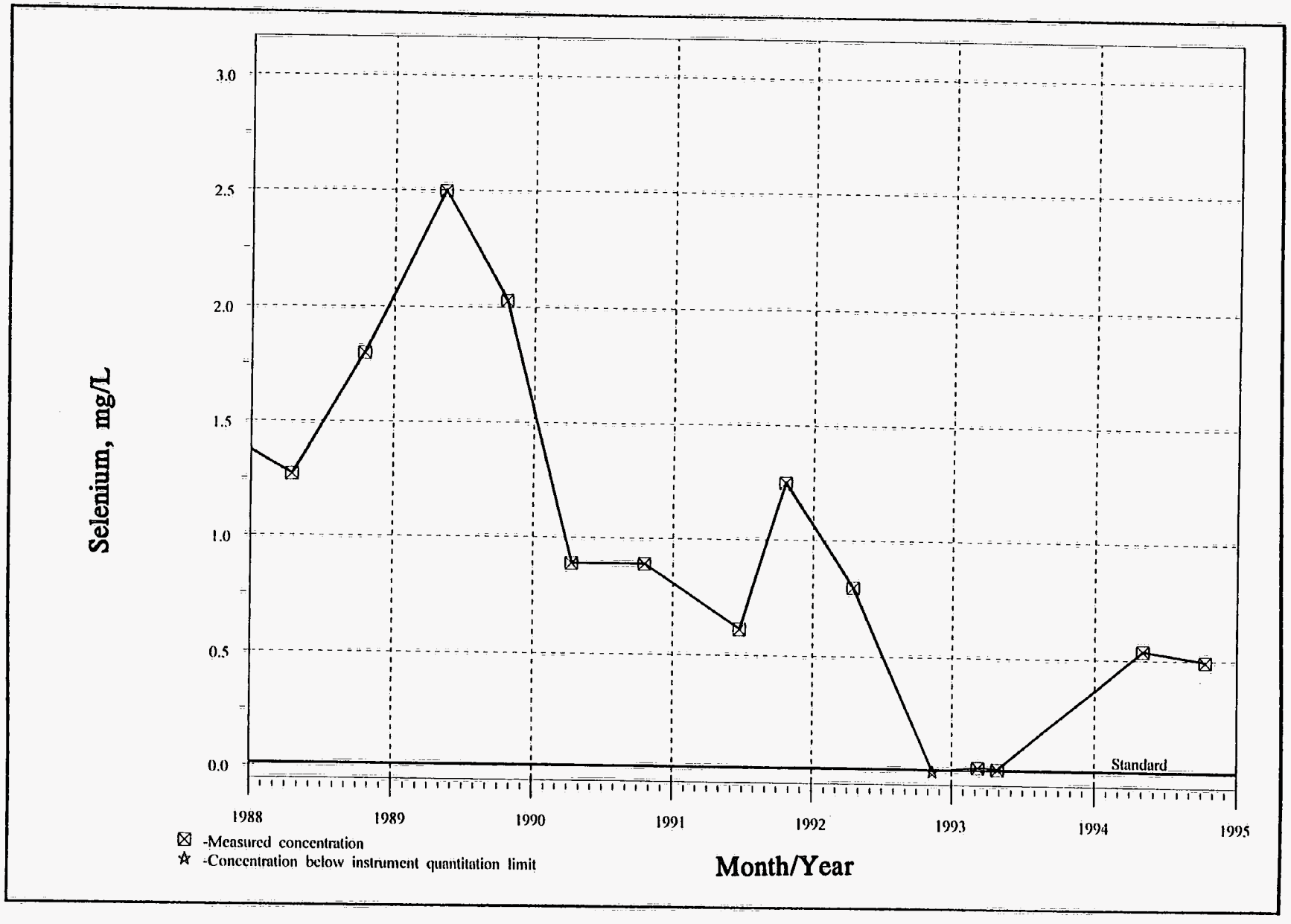

Figure B-10. Selenium Concentrations at W-2 (on-site seep) from January 1988 through October 1994

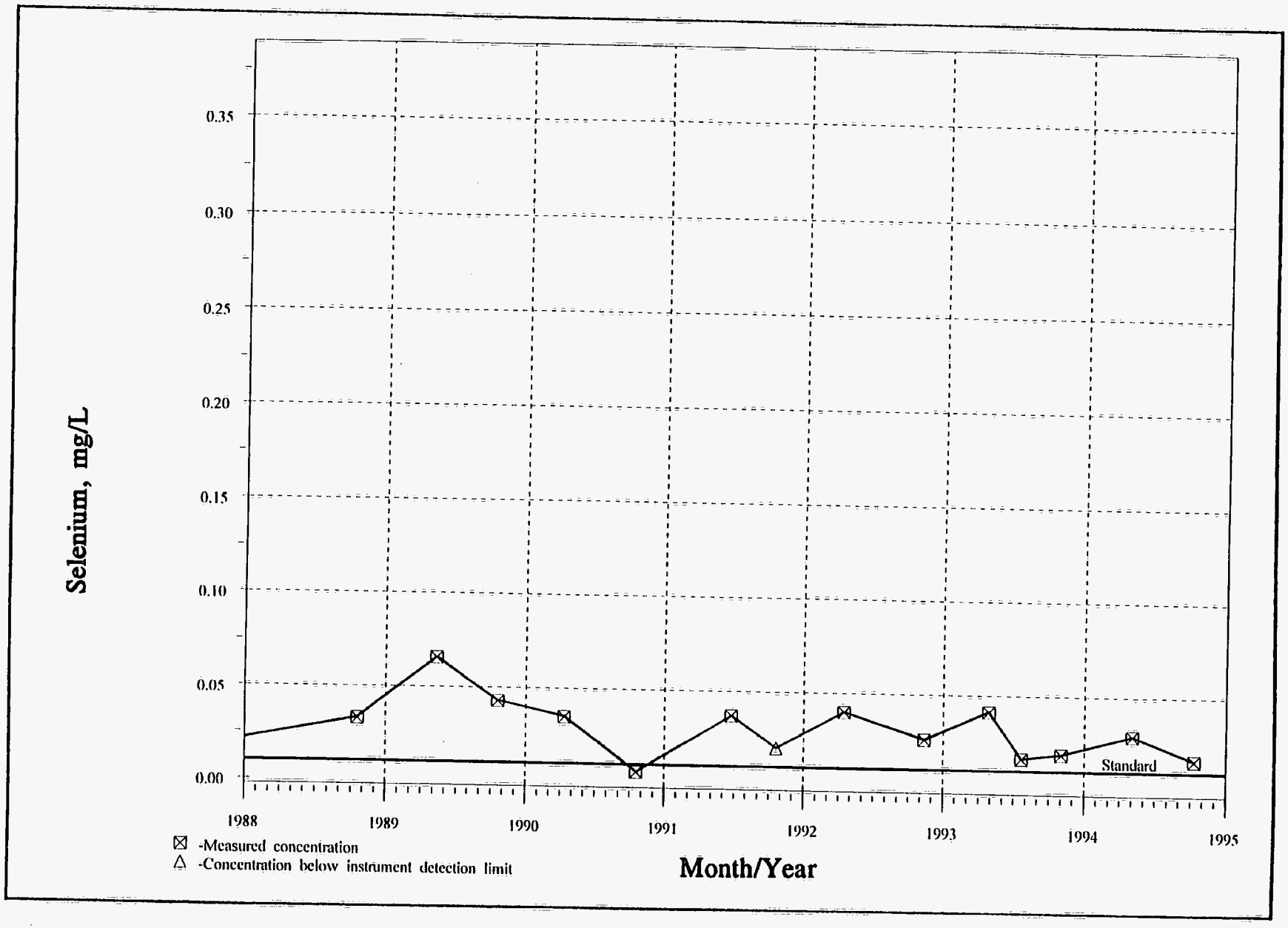

Figure B-11. Selenium Concentrations at Carbonate Seep (on site) from January 1988 through October 1994

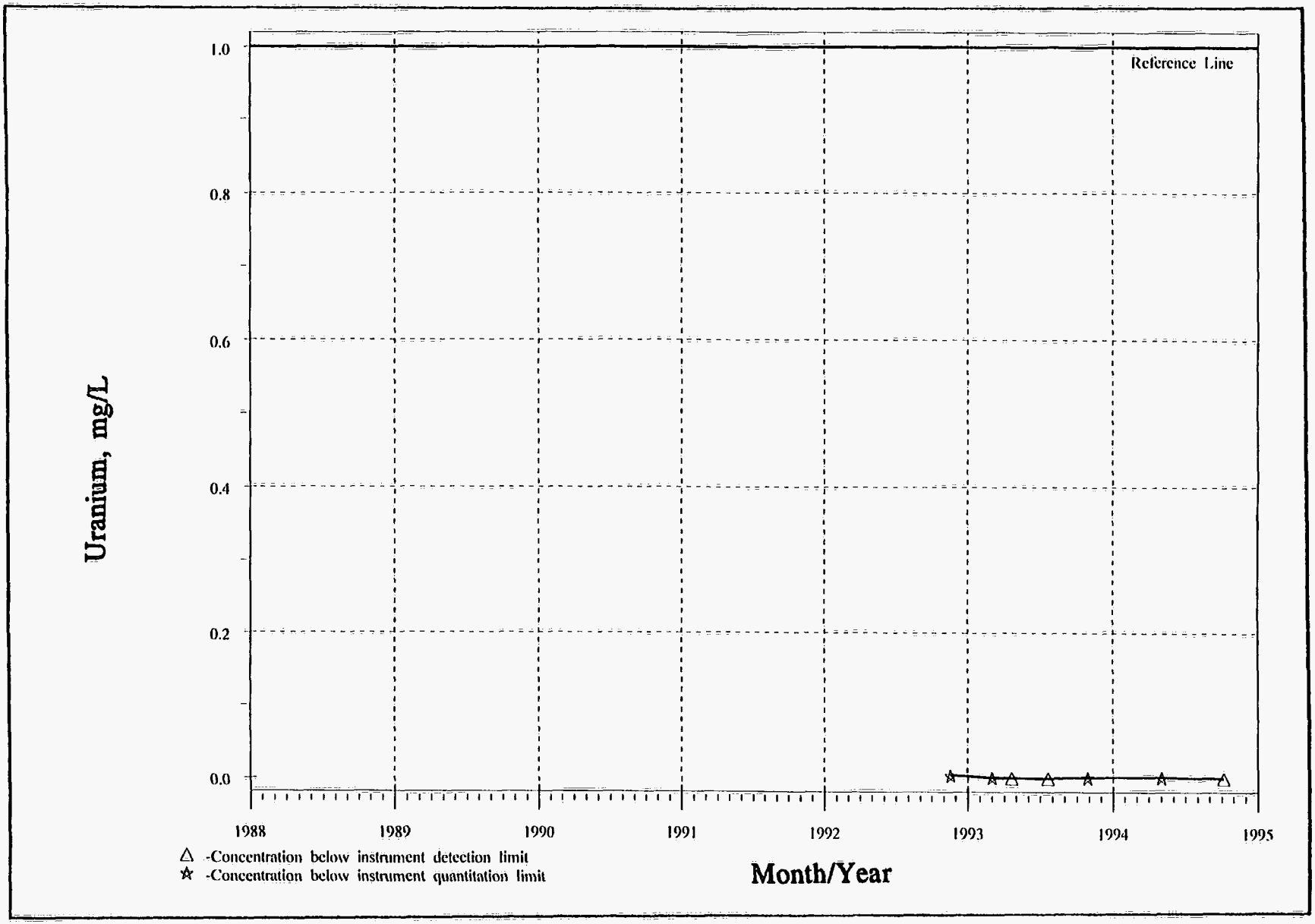

Figure B-12. Uranium Concentrations at SW92-02 (upstream) from November 1992 through October 1994

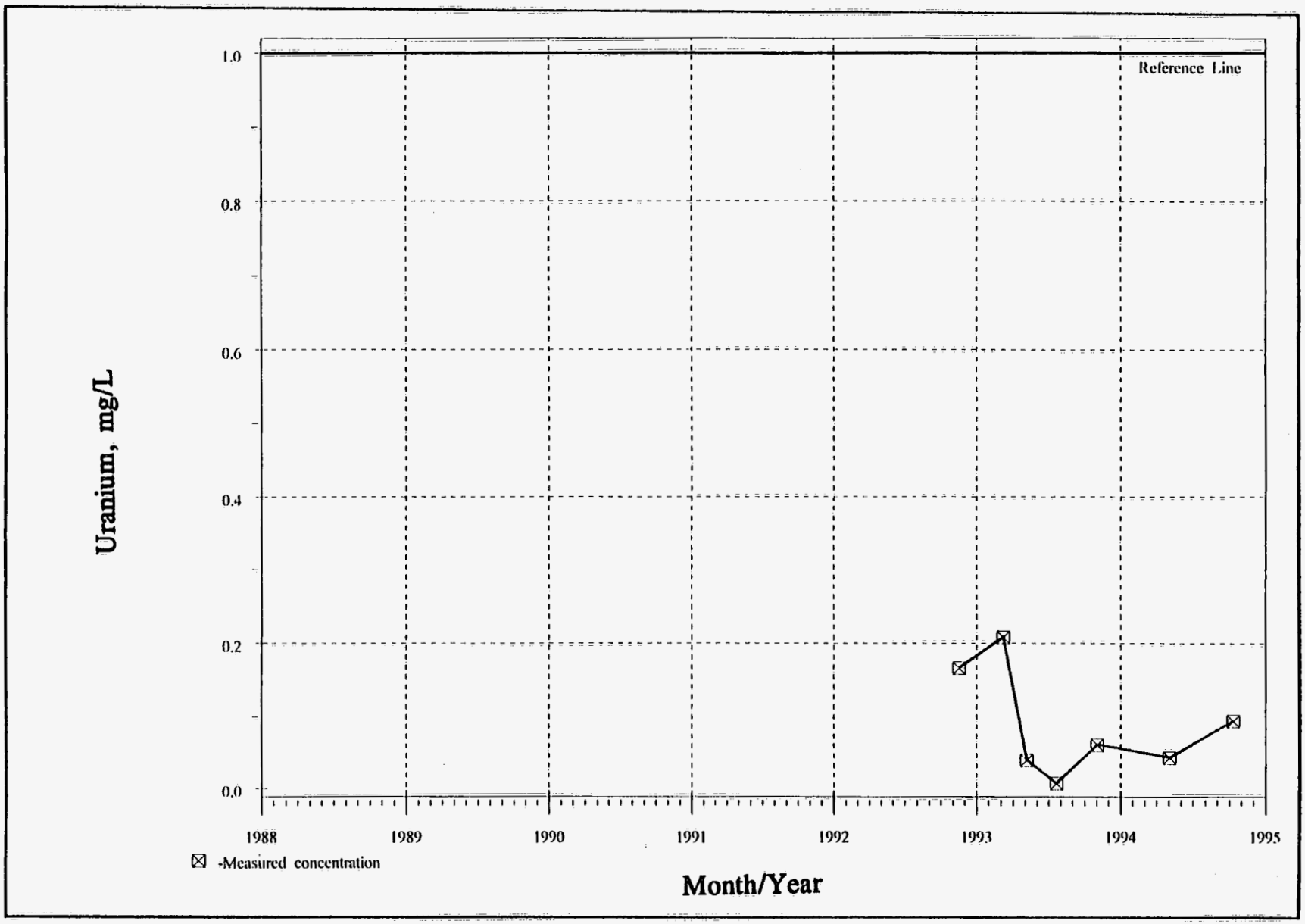

Figure B-13. Uranium Concentrations at SW92-04 (on site) from November 1992 through October 1994

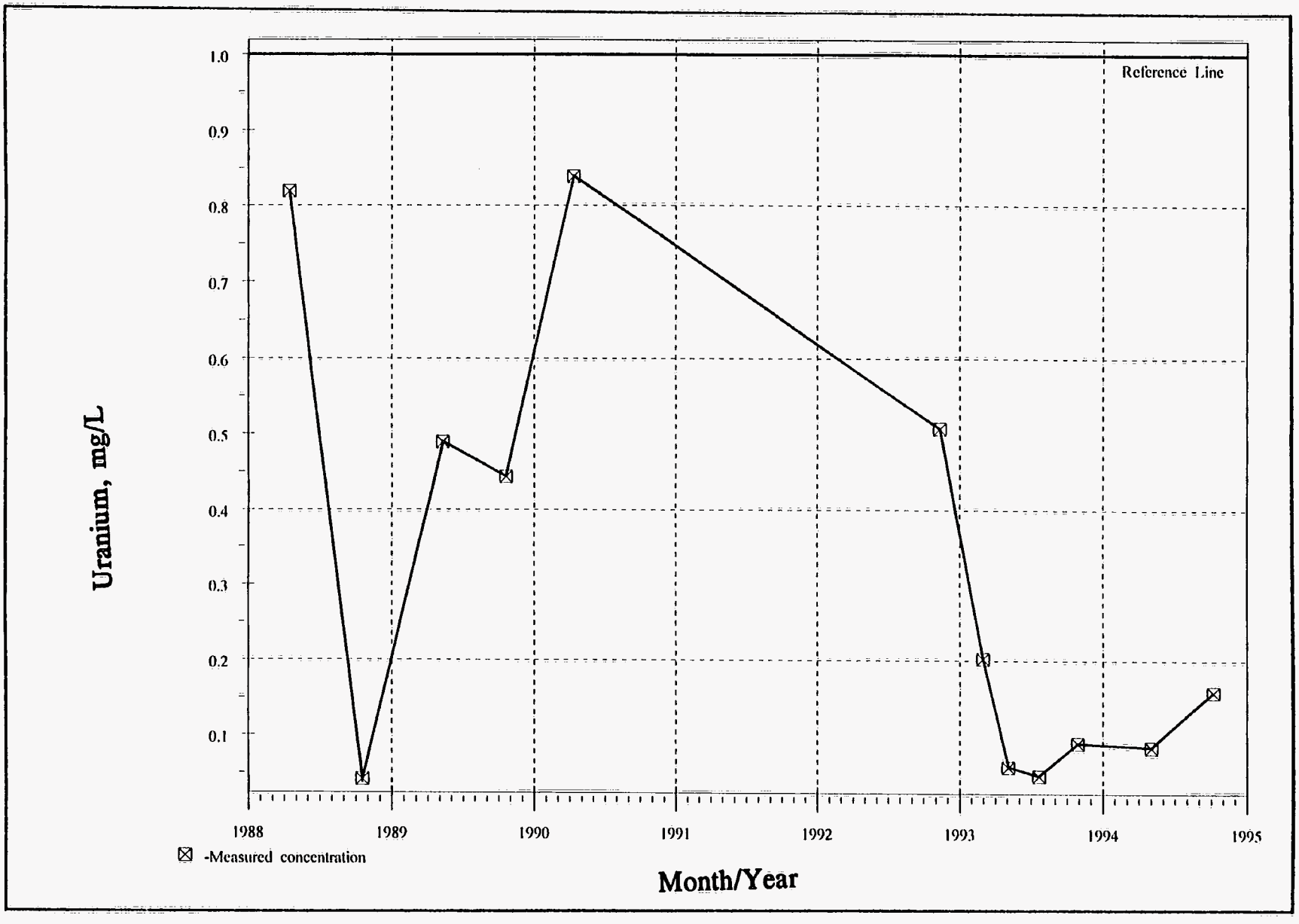

Figure B-14. Uranium Concentrations at W-4 (downstream) from April 1988 through October 1994

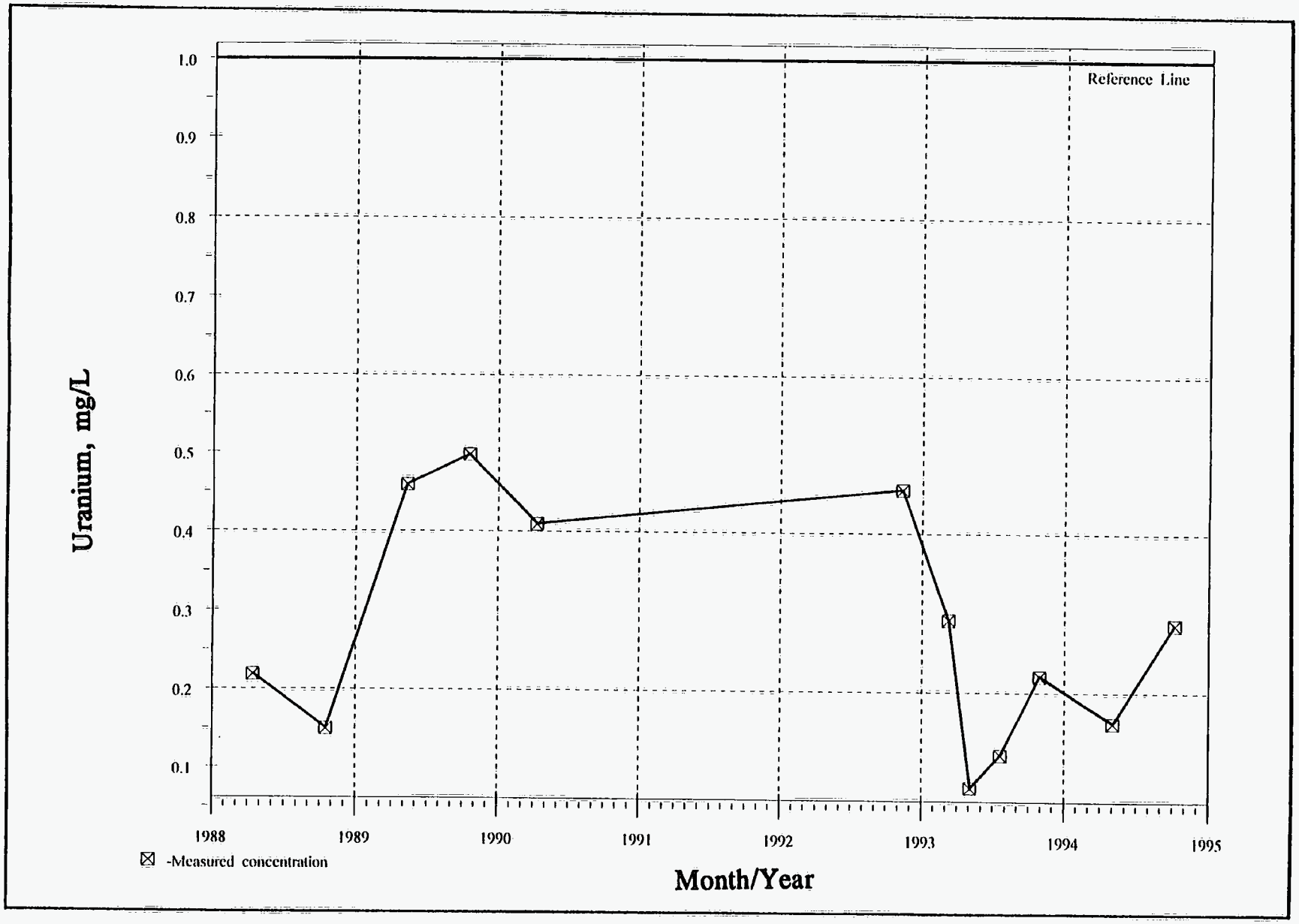

Figure B-15. Uranium Concentrations at Sorenson Site (downstream) from April 1988 through October 1994

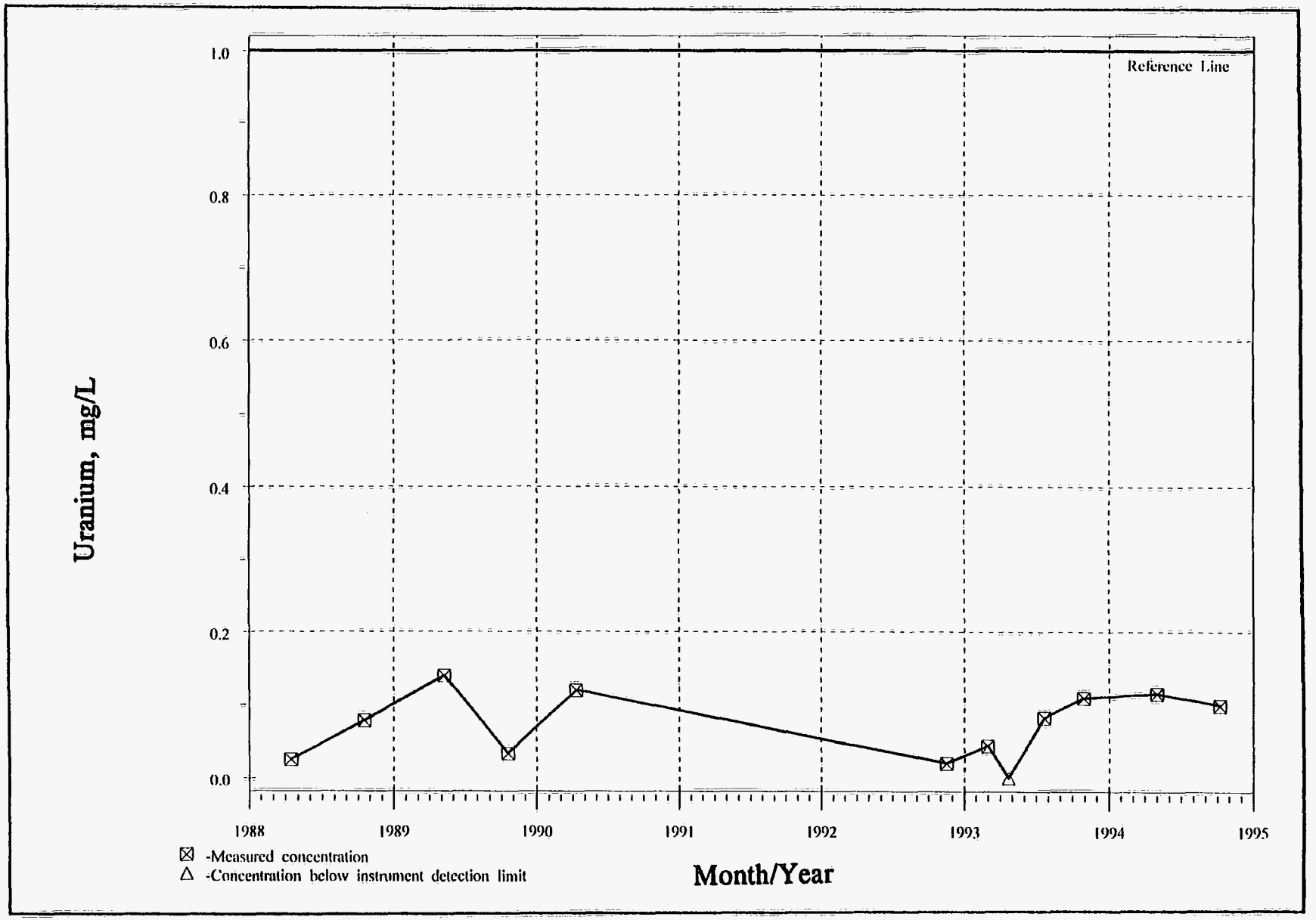

Figure B-16. Uranium Concentrations at Montezuma Canyon (downstream) from April 1988 through October 1994

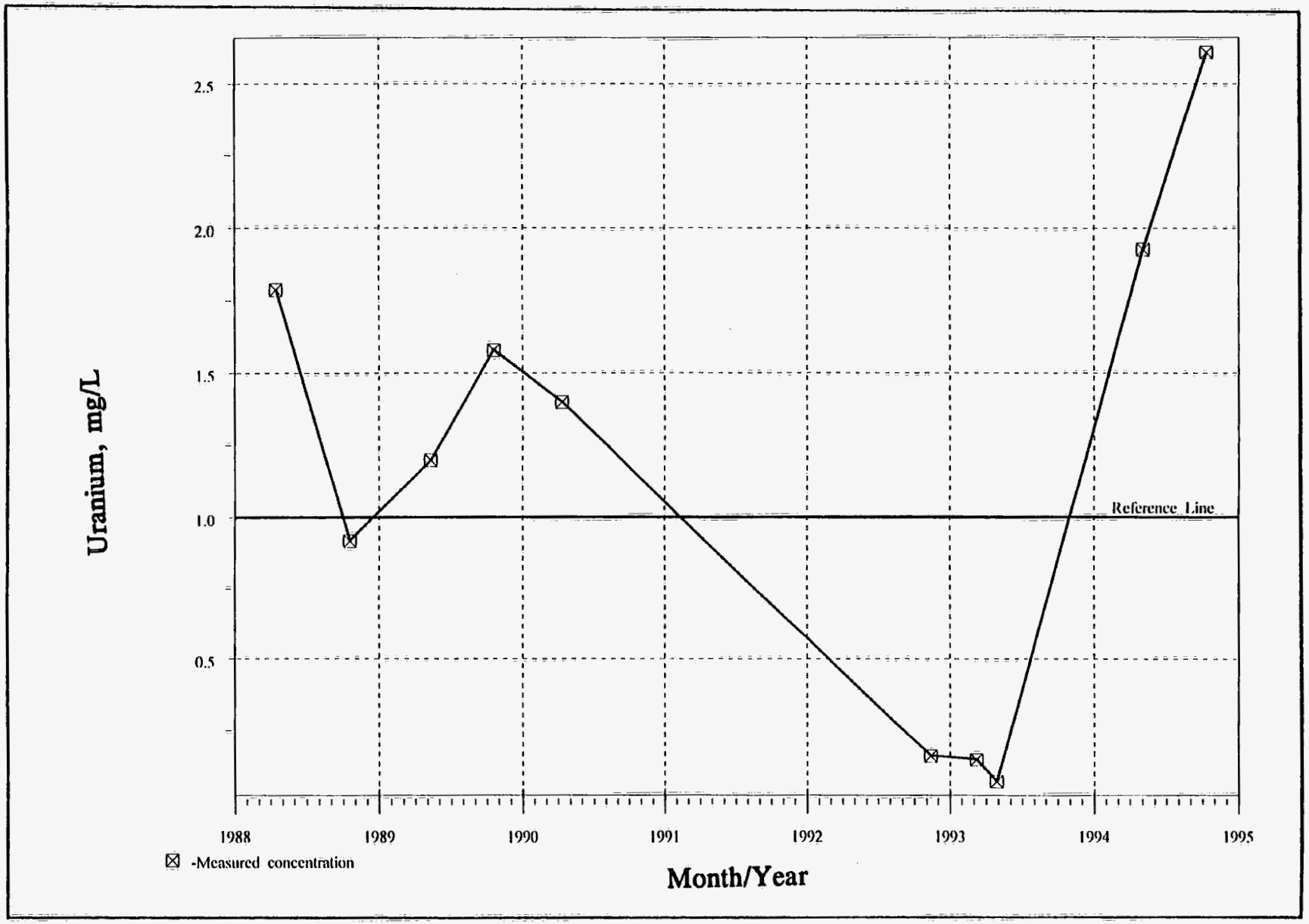

Figure B-17. Uranium Concentrations at W-2 (on-site seep) from April 1988 through October 1994

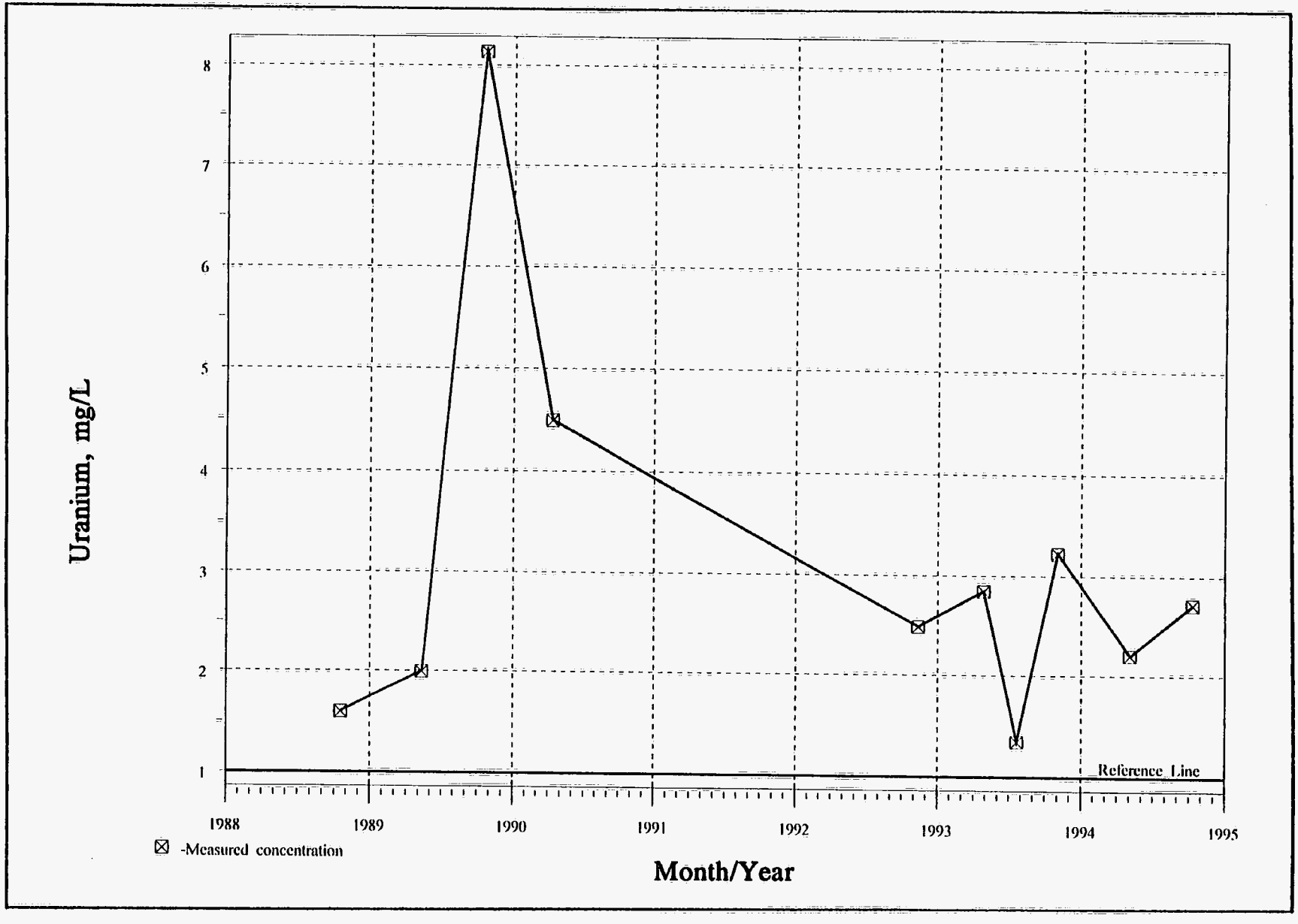

Figure B-18. Uranium Concentrations at Carbonate Seep (on site) from October 1988 through October 1994

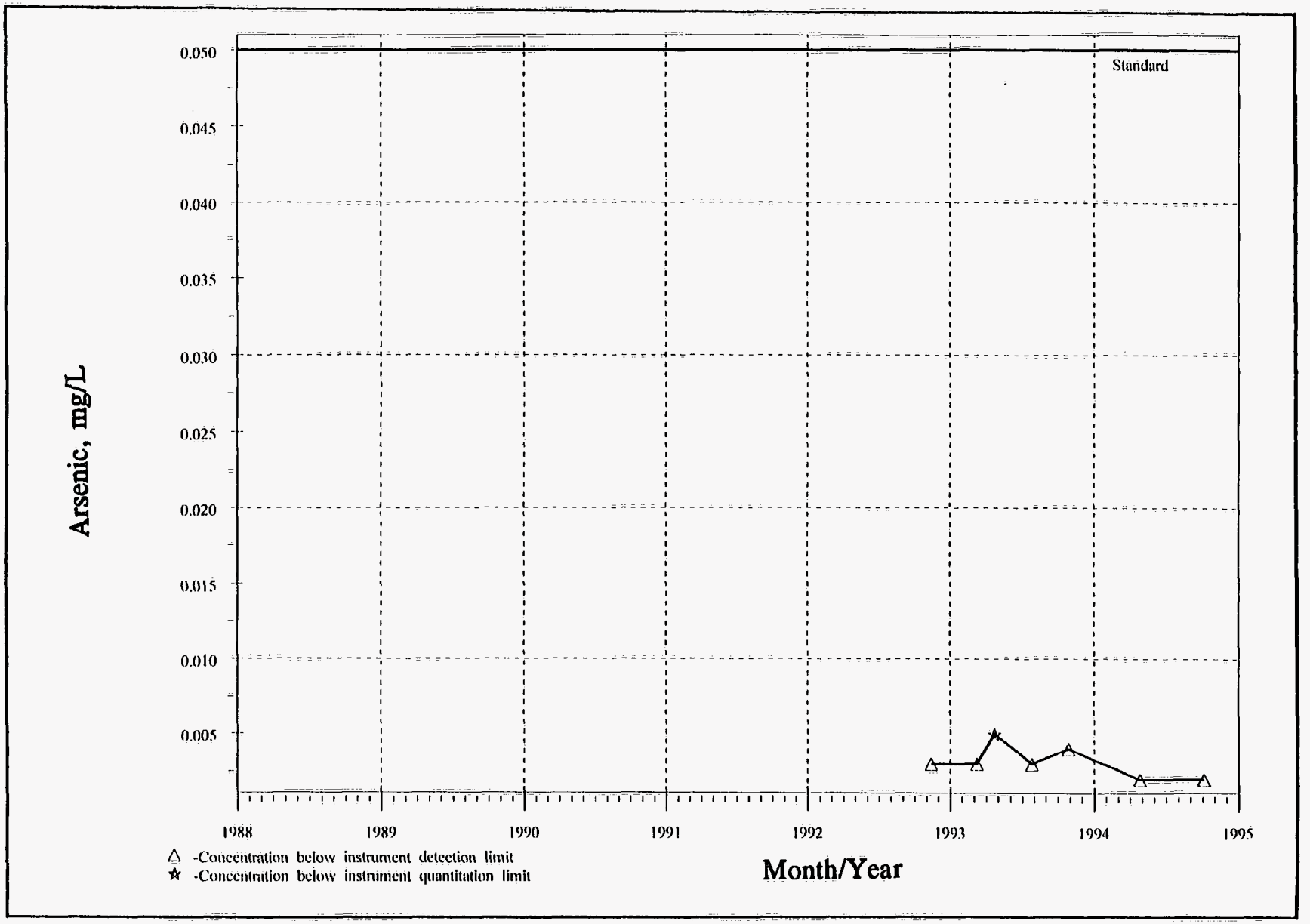

Figure B-19. Arsenic Concentrations in Upgradient Well 92-03 from November 1992 through October 1994

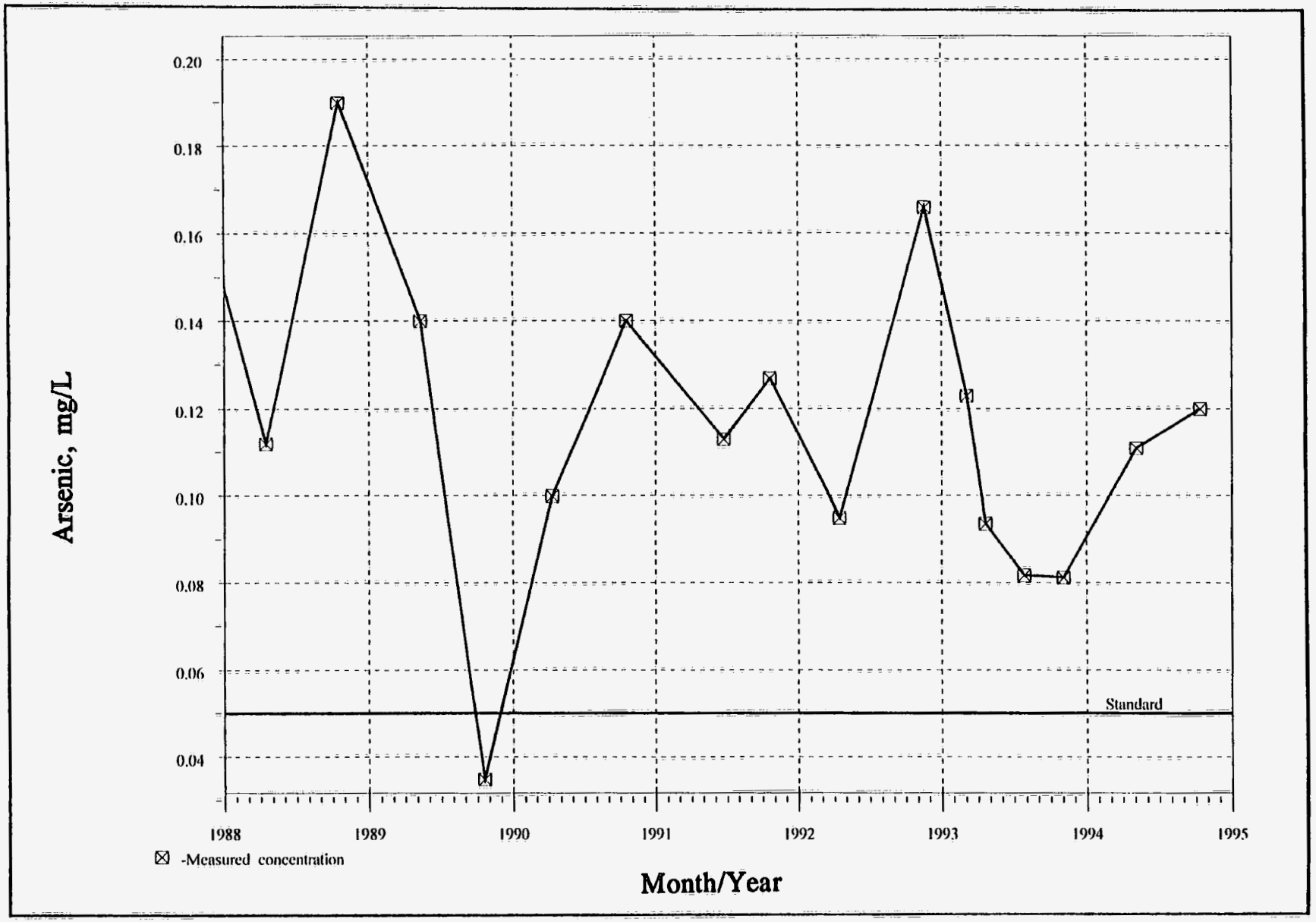

Figure B-20. Arsenic Concentrations in On-Site Well 82-30B from January 1988 through October 1994

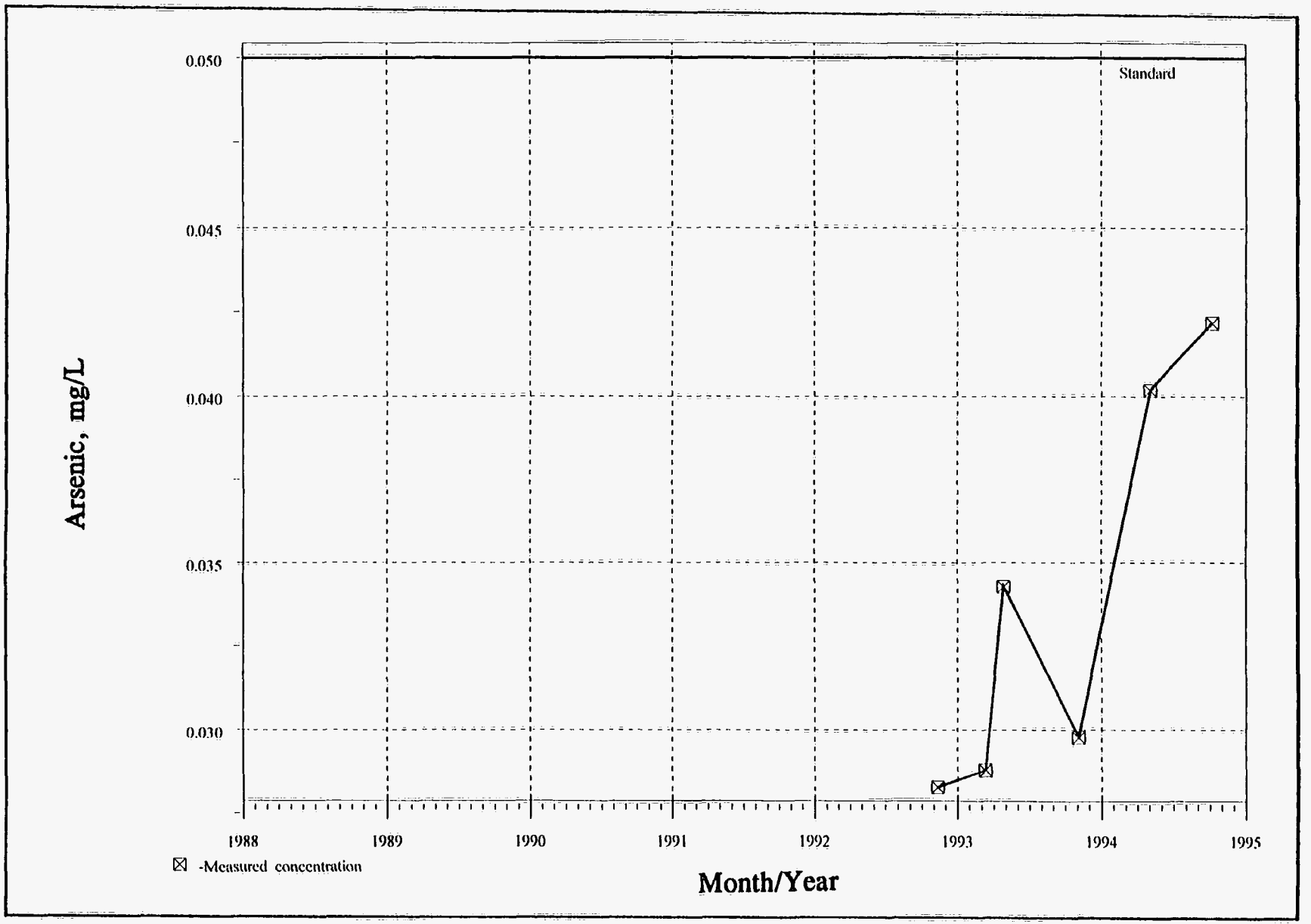

Figure B-21. Arsenic Concentrations in Downgradient Well 92-11 from November 1992 through October 1994

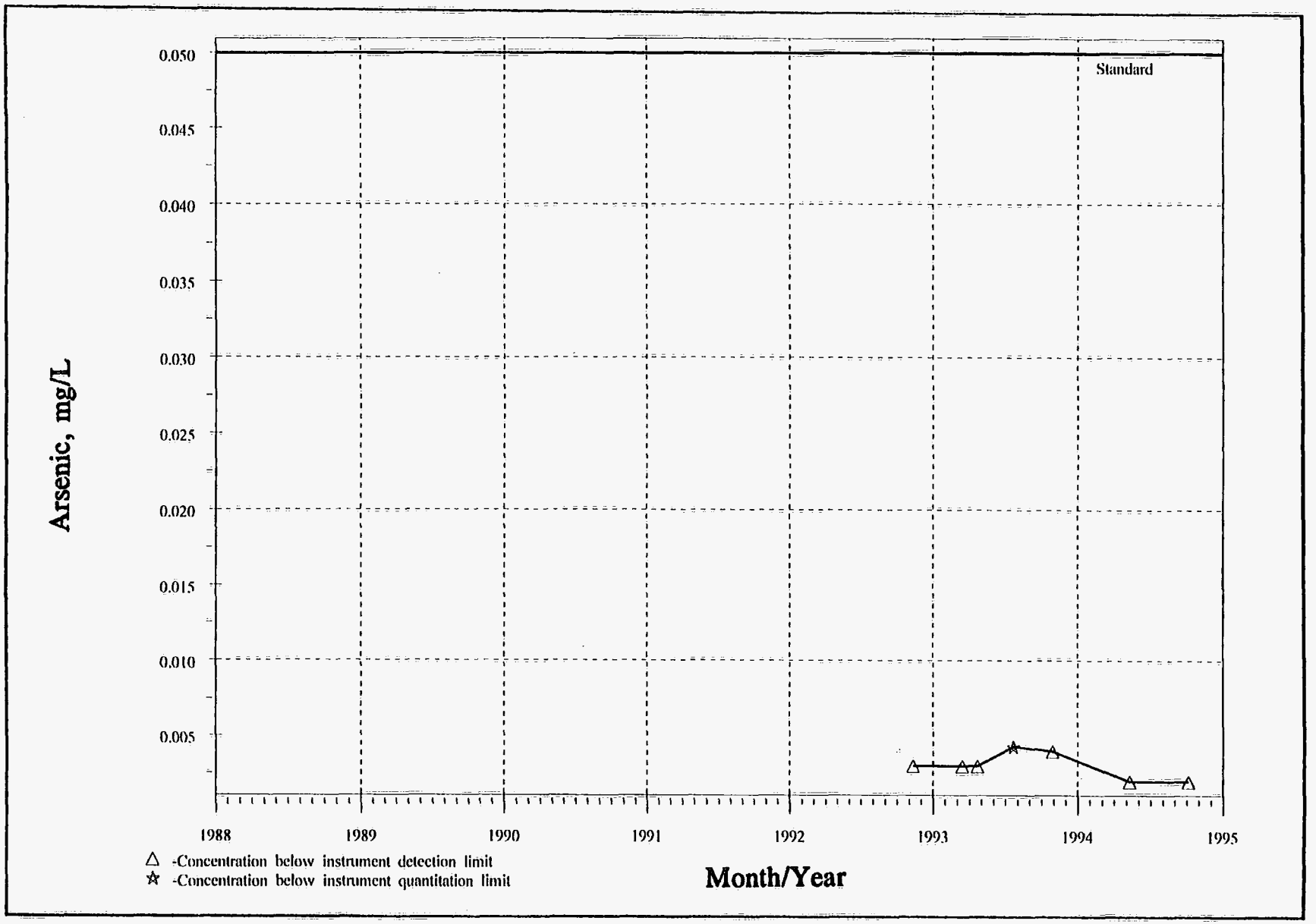

Figure B-22. Arsenic Concentrations in Downgradient Well 92-09 from November 1992 through October 1994

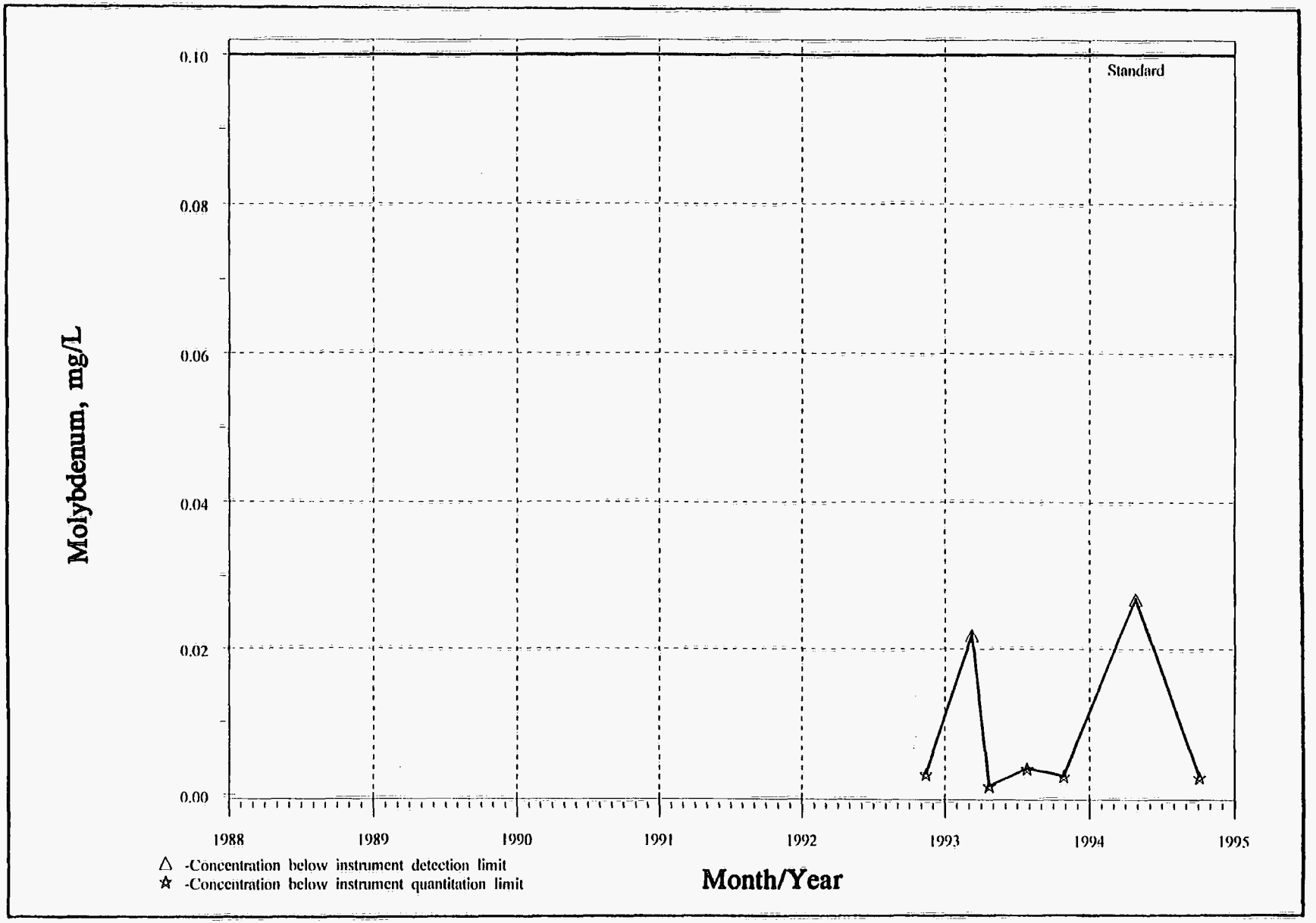

Figure B-23. Molybdenum Concentrations in Upgradient Well 92-03 from November 1992 through October 1994

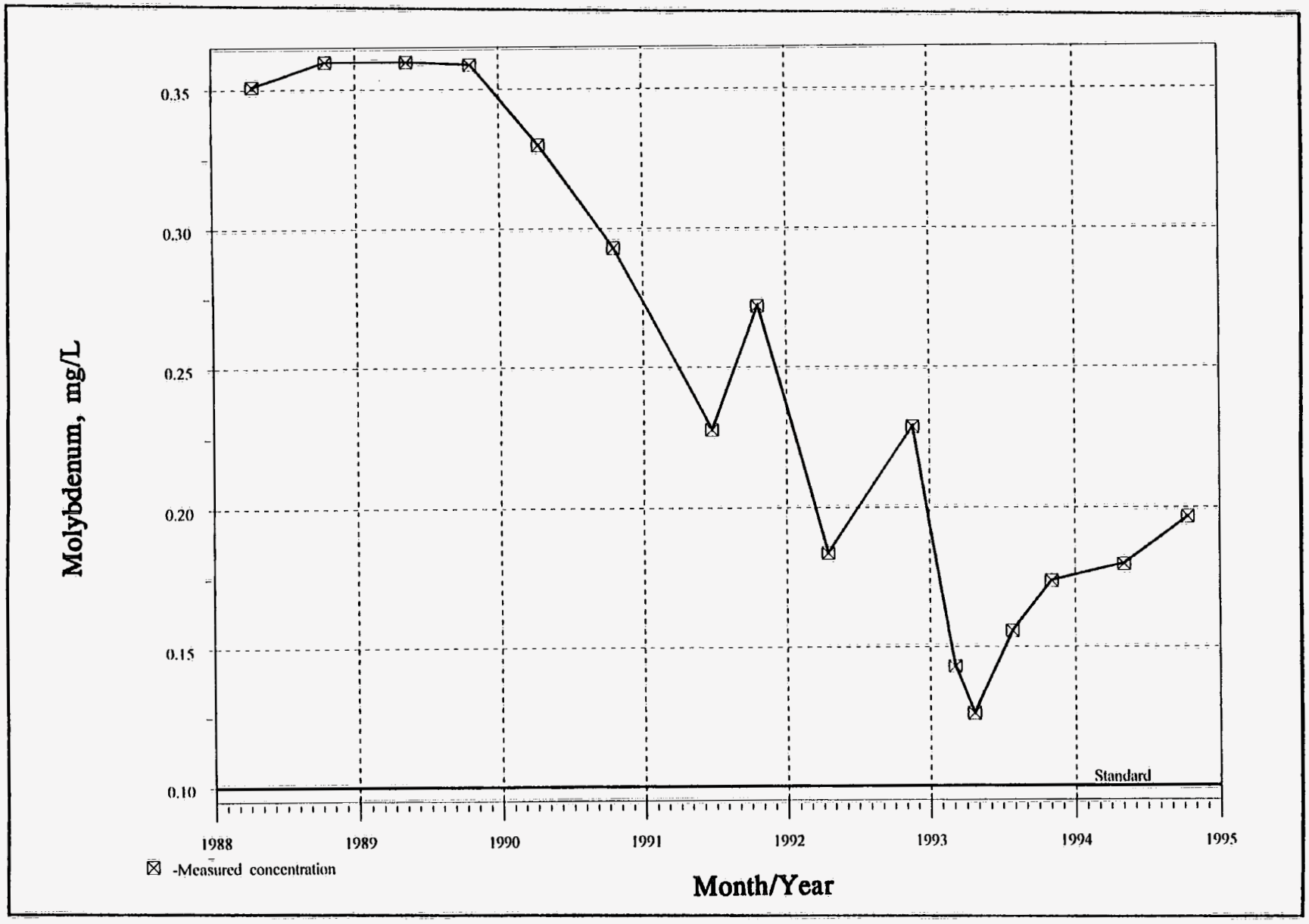

Figure B-24. Molybdenum Concentrations in On-Site Well 82-30B from April 1988 through October 1994

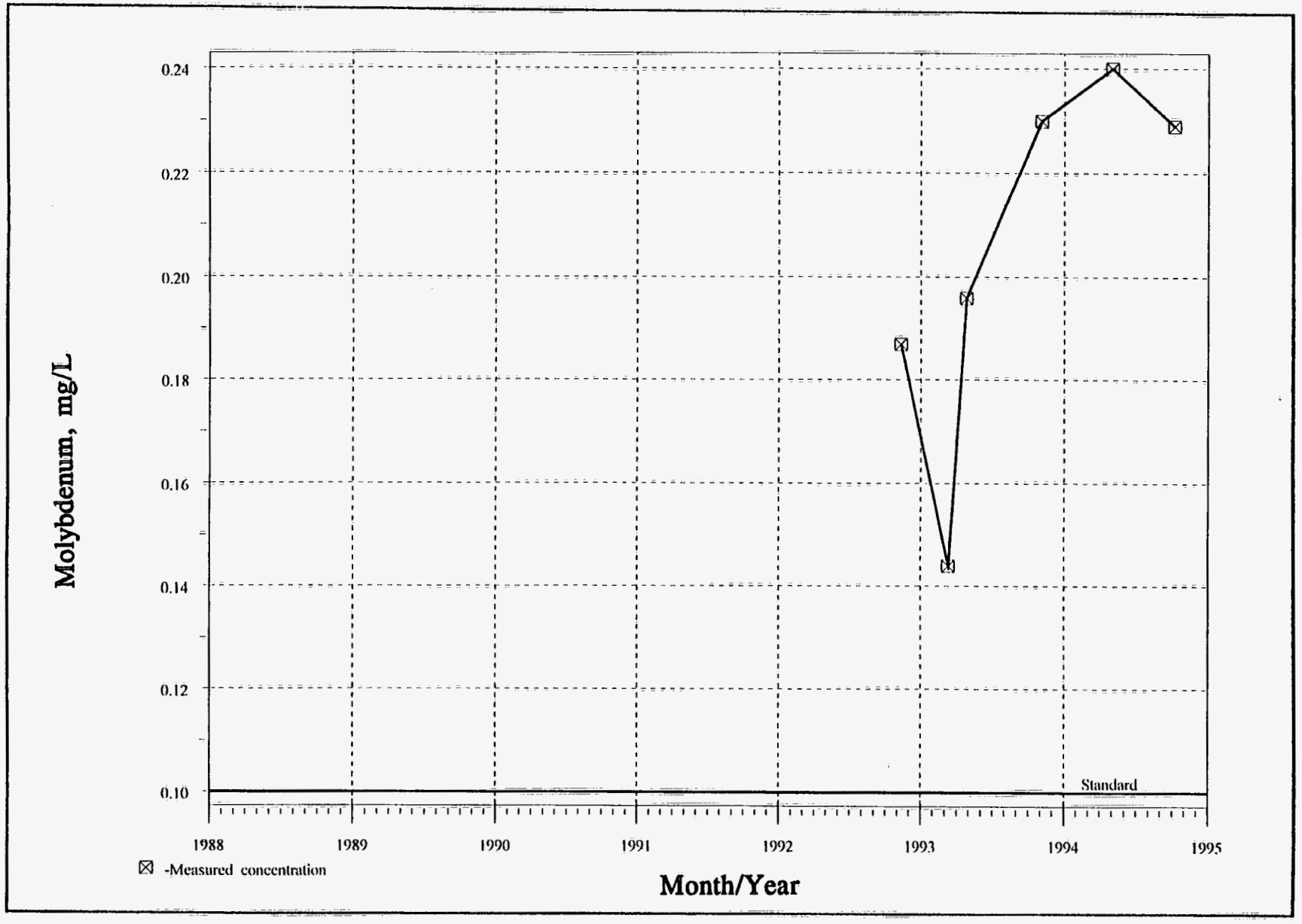

Figure B-25. Molybdenum Concentrations in Downgradient Well 92-11 from November 1992 through October 1994

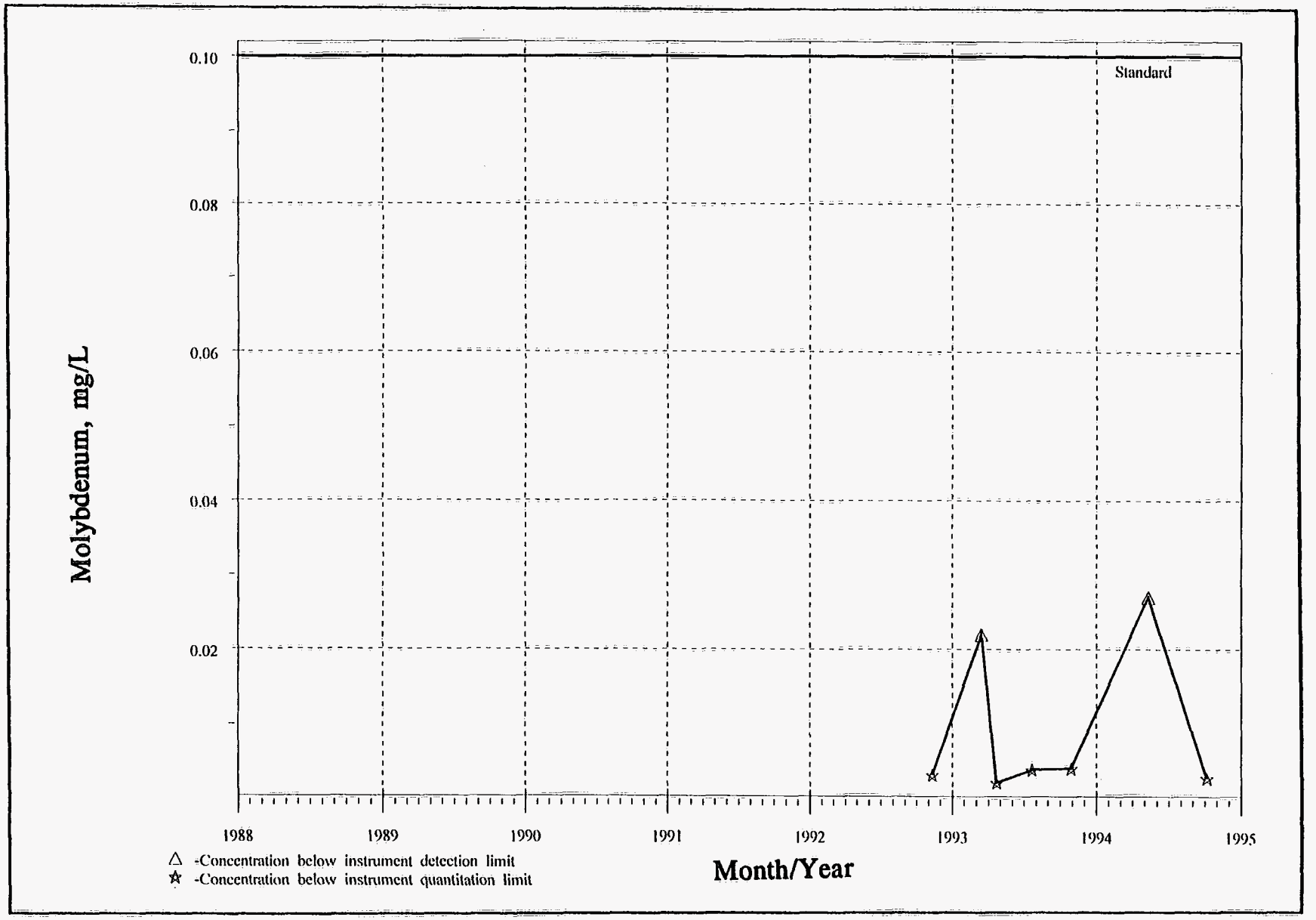

Figure B-26. Molybdenum Concentrations in Downgradient Well 92-09 from November 1992 through October 1994

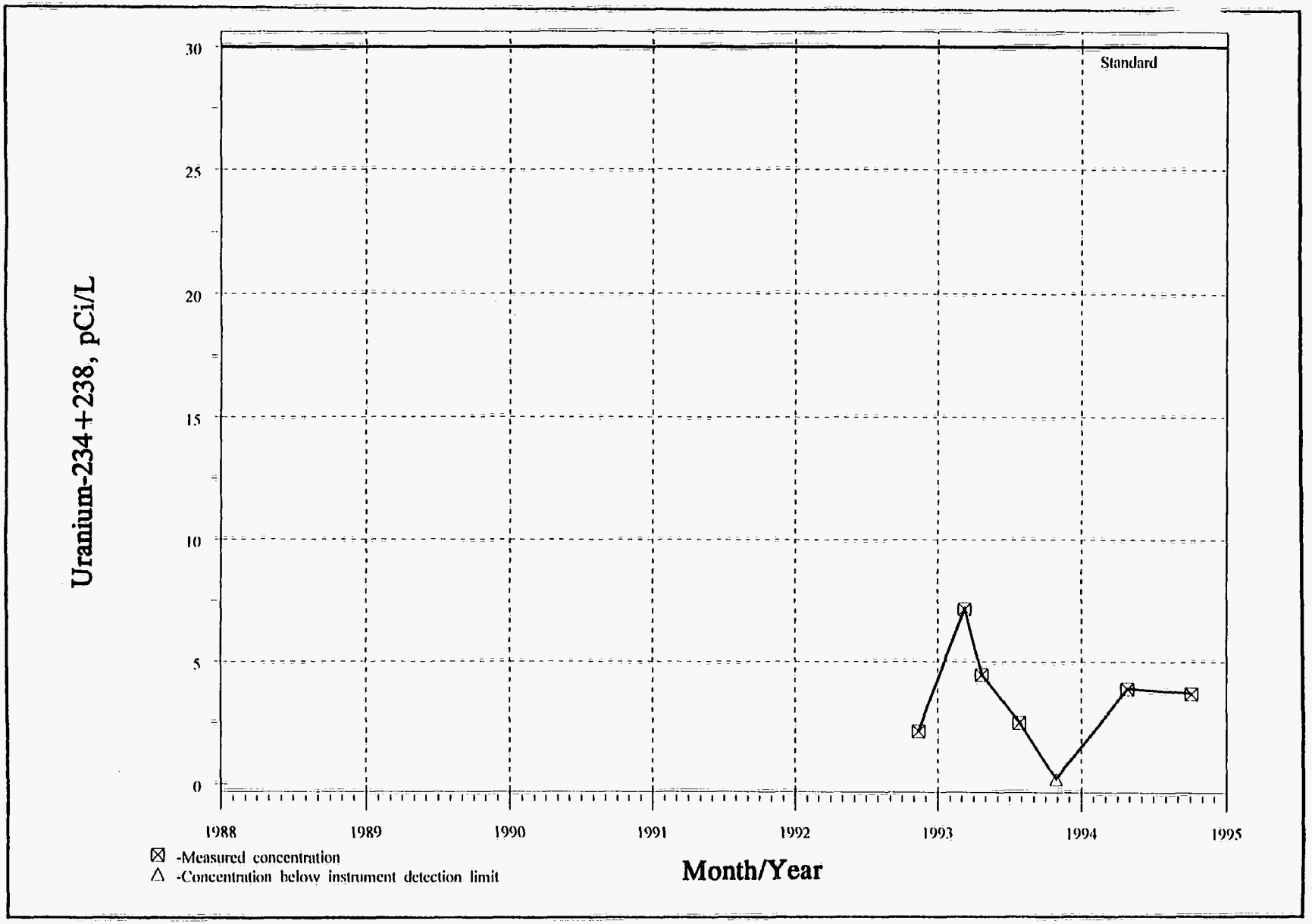

Figure B-27. Uranium-234+238 Activities in Upgradient Well 92-03 from November 1992 through October 1994

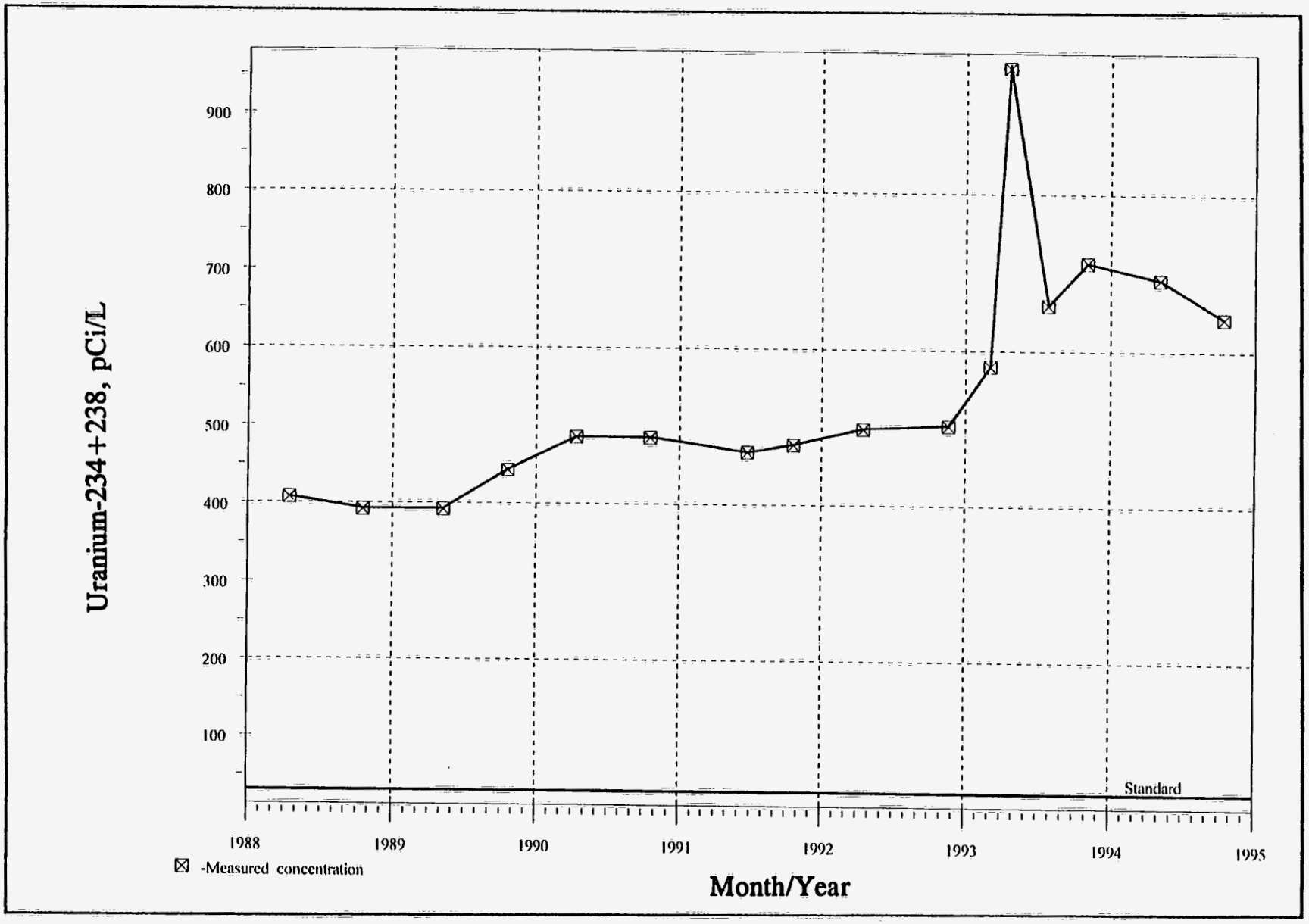

Figure B-28. Uranium-234+238 Activities in On-Site Well 82-30B from April 1988 through October 1994

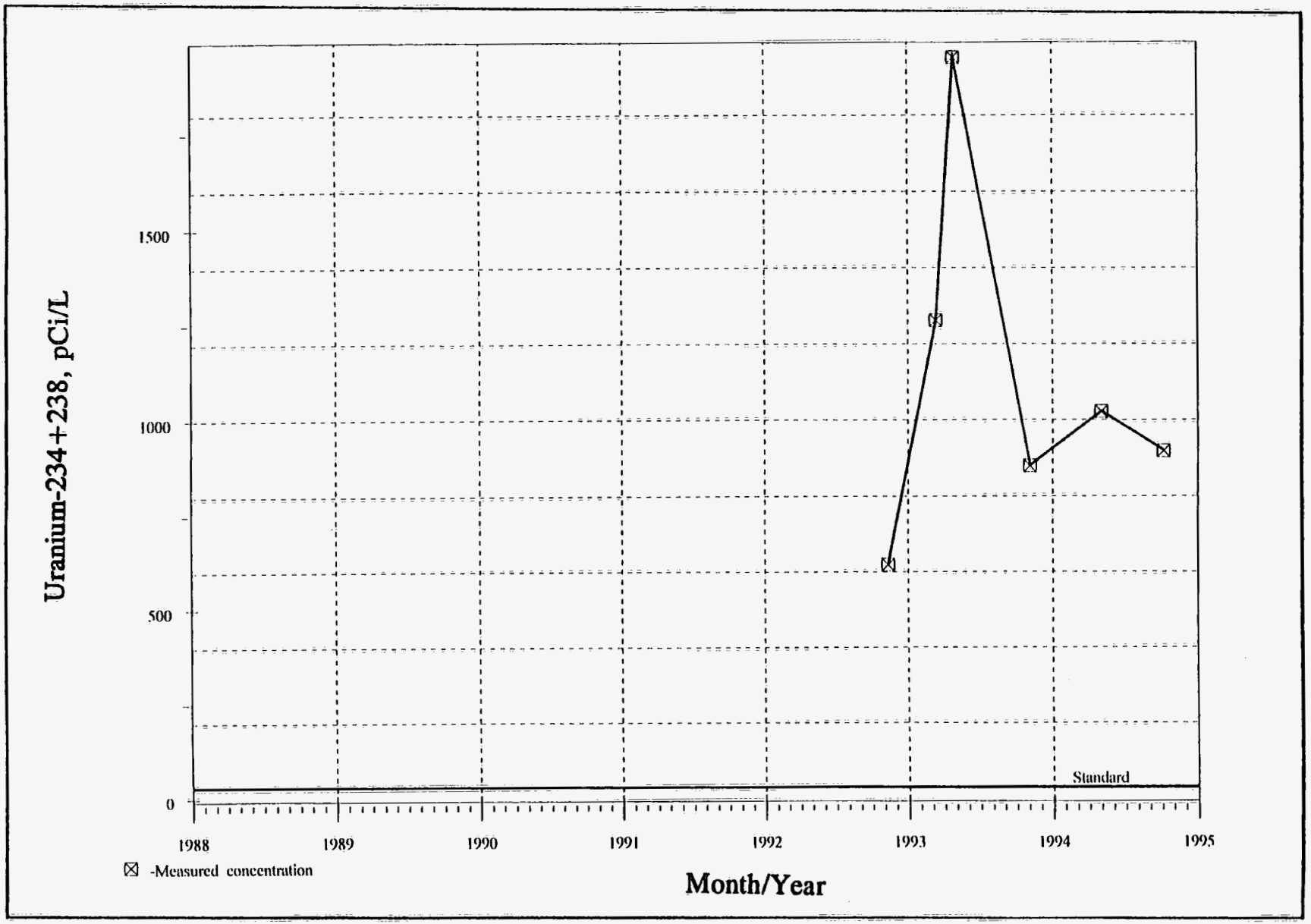

Figure B-29. Uranium-234+238 Activities in Downgradient Well 92-11 from November 1992 through October 1994

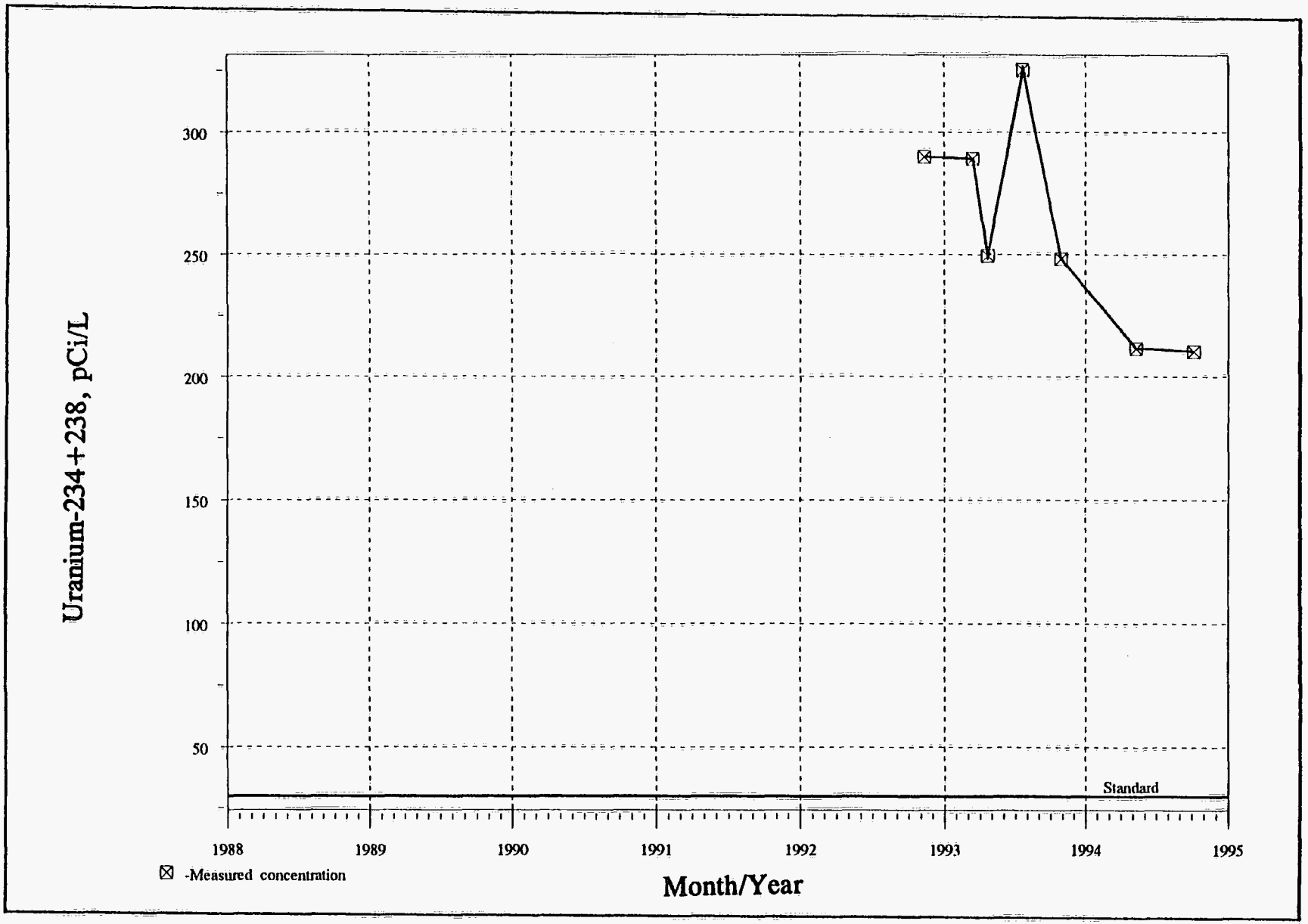

Figure B-30. Uranium-234+238 Activities in Downgradient Well 92-09 from November 1992 through October 1994

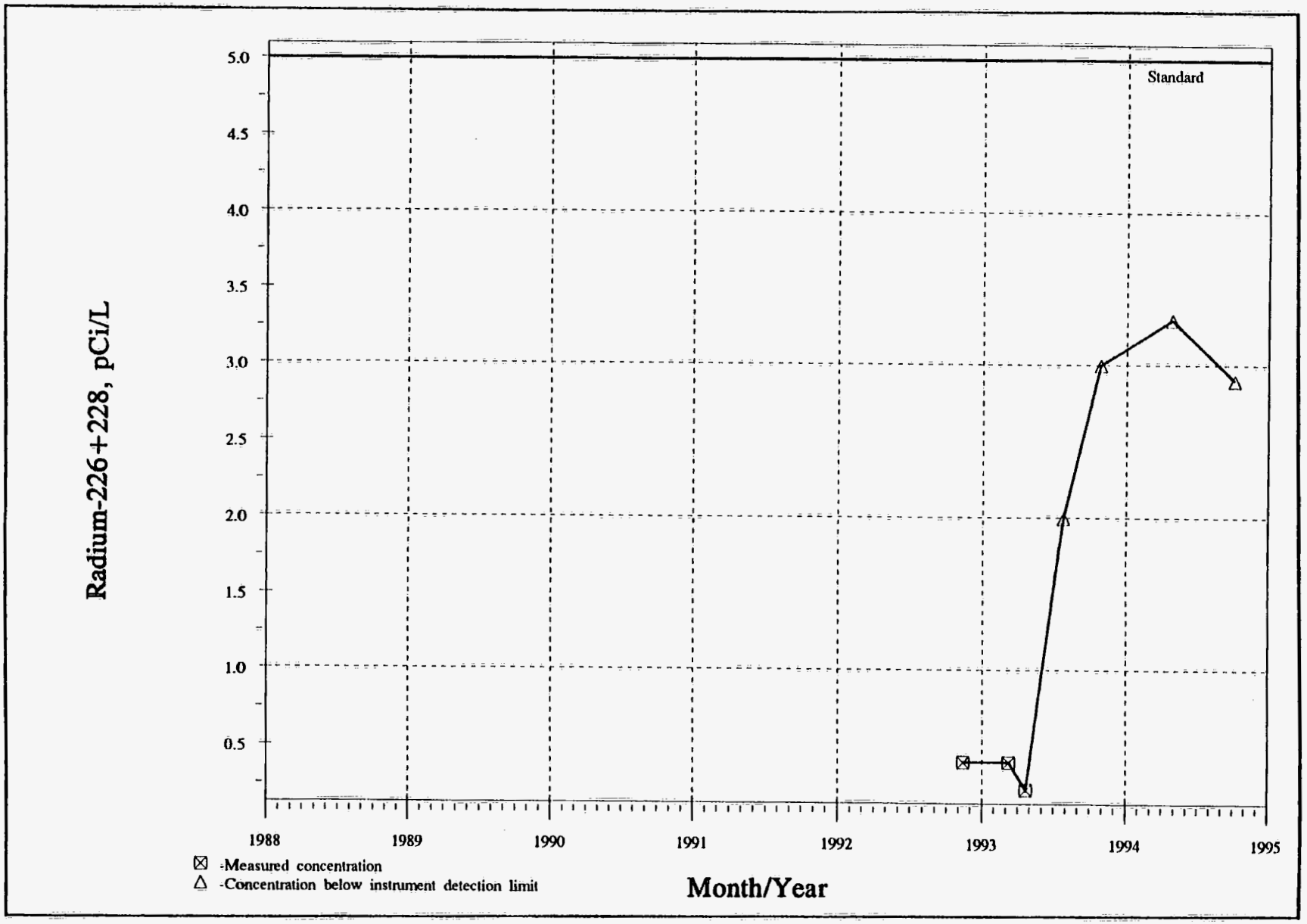

Figure B-31. Radium-226+228 Activities in Upgradient Well 92-03 from November 1992 through October 1994

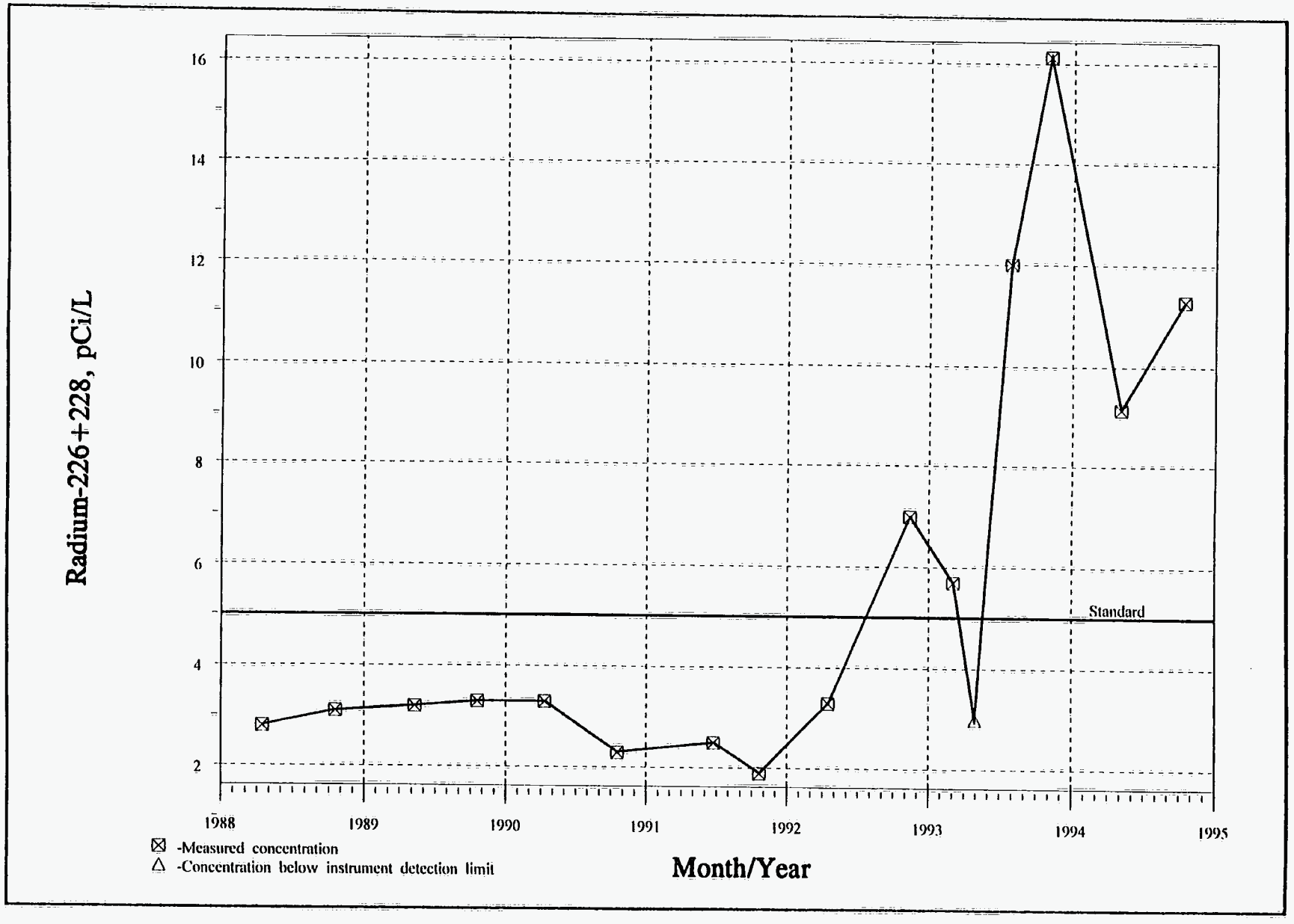

Figure B-32. Radium-226+228 Activities in On-Site Well 82-40A from April 1988 through October 1994

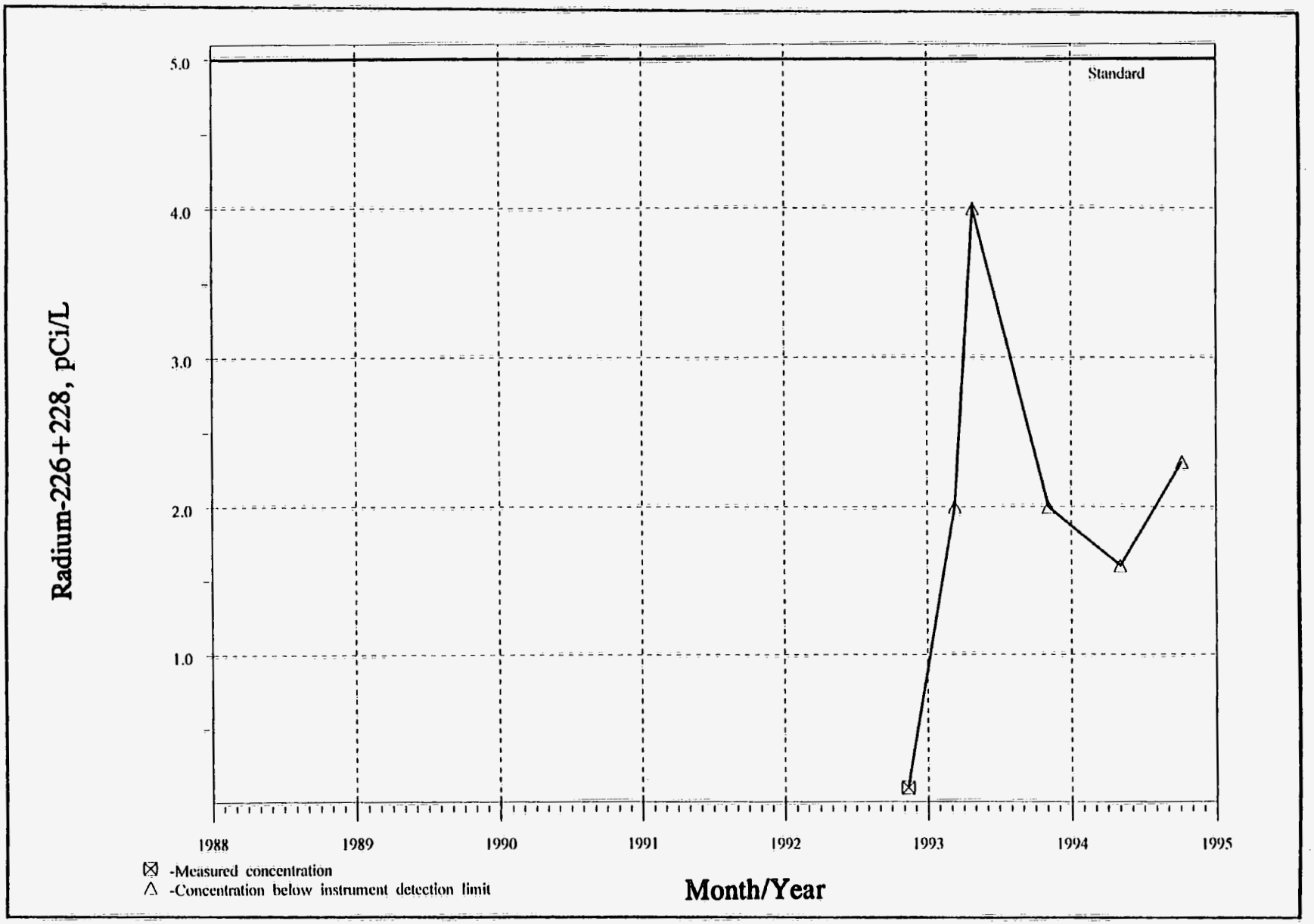

Figure B-33. Radium-226+228 Activities in Downgradient Well 92-11 from November 1992 through October 1994

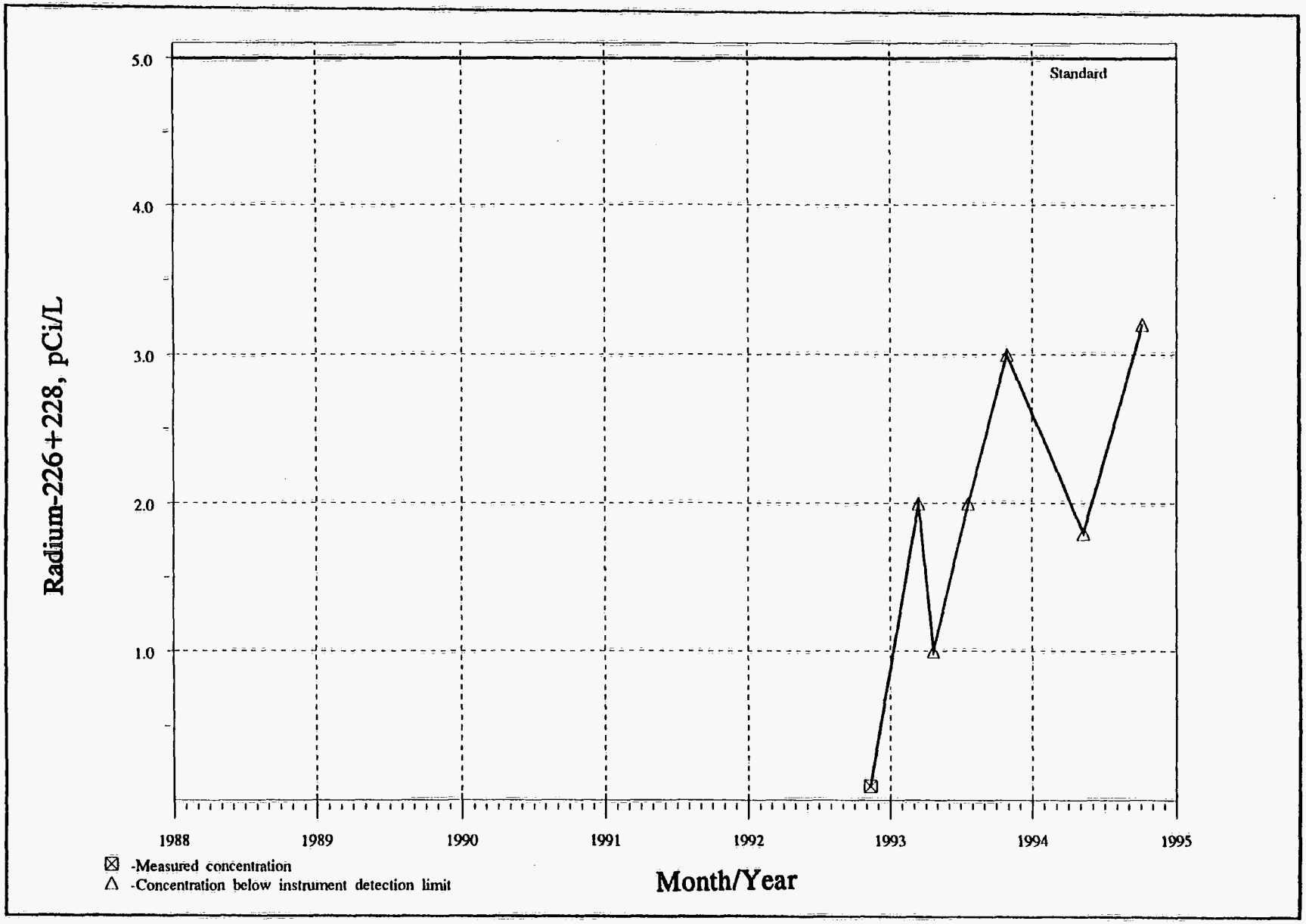

Figure B-34. Radium-226+228 Activities in Downgradient Well 92-09 from November 1992 through October 1994

Appendix C

Well Location Maps Showing Groundwater Analytes that Exceed Federal/State Standards

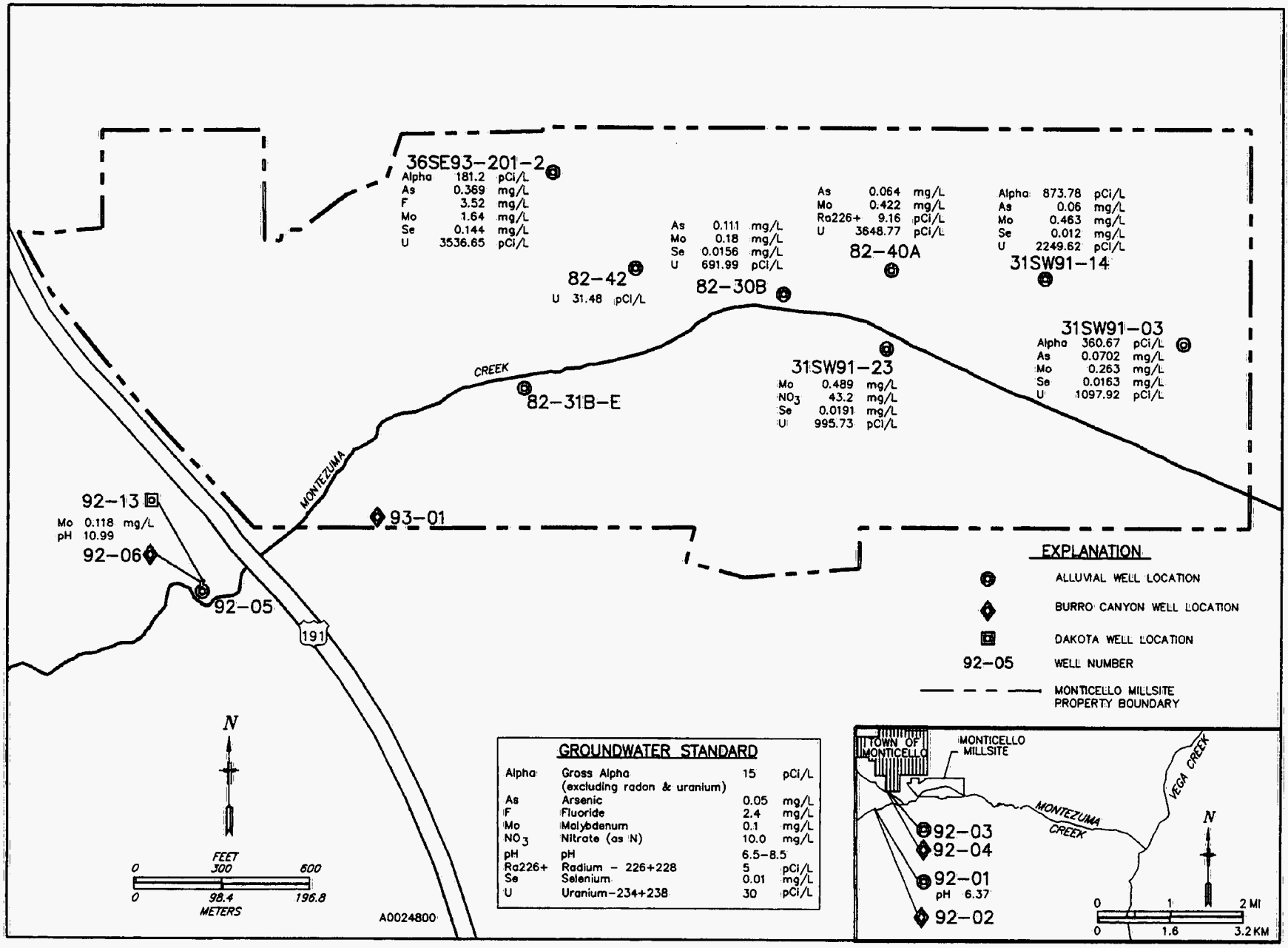

Figure C-1. Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples On and Upgradient of Monticello Millsite in April/May 1994

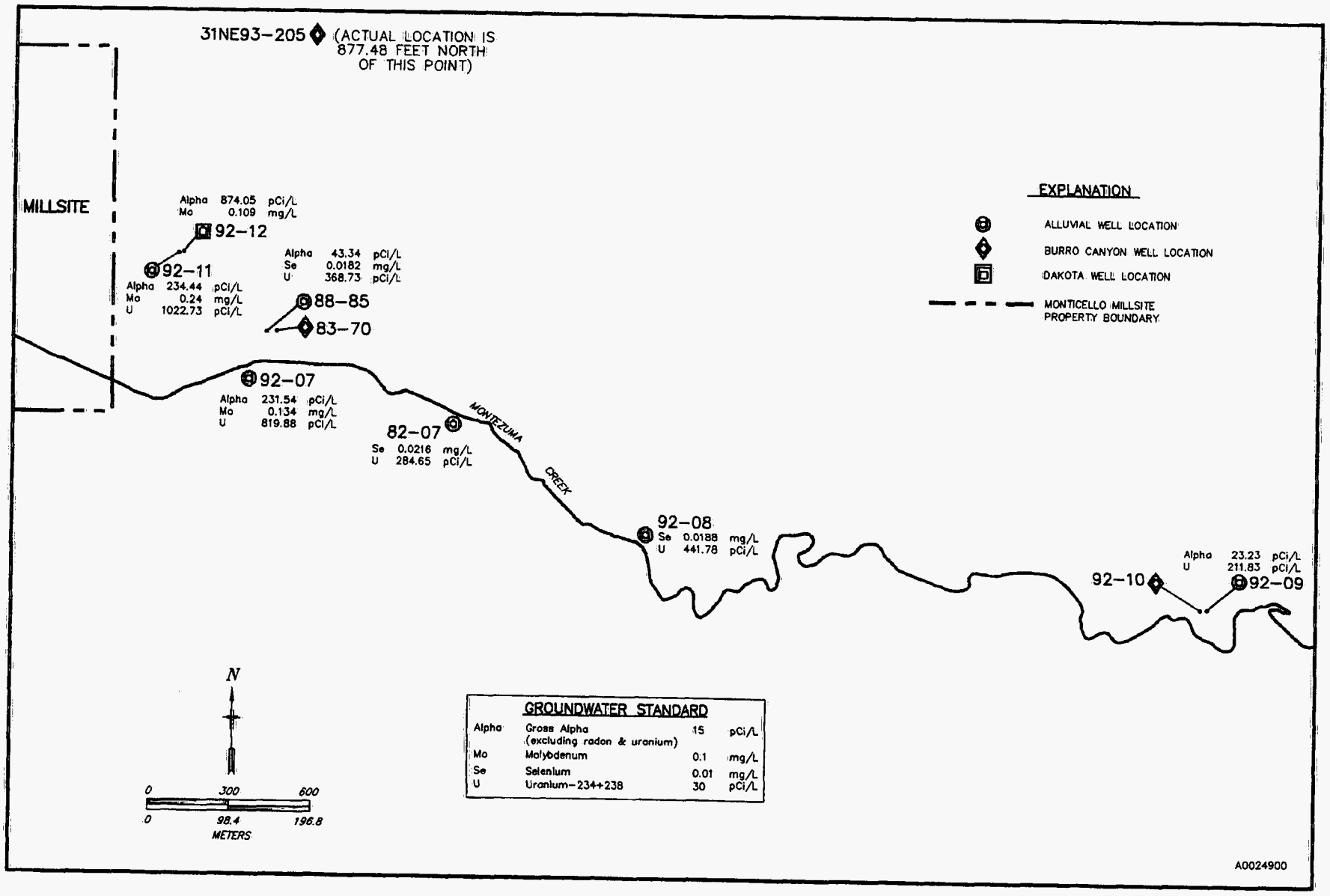

Figure C-2. Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples Downgradient and Crossgradient of Monticello Millsite in April/May 1994

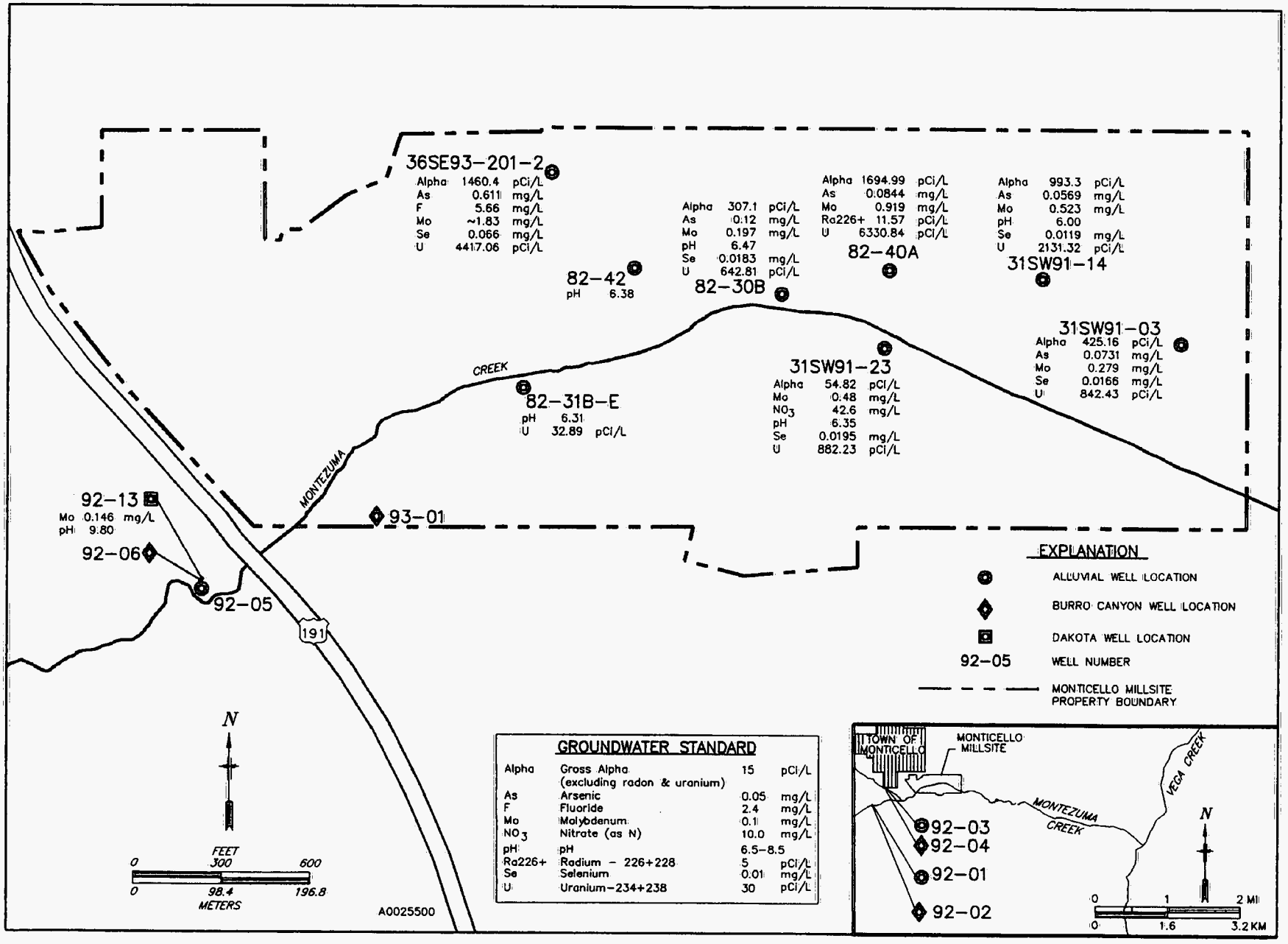

Figure C-3. Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples On and Upgradient of Monticello Millsite in October 1994

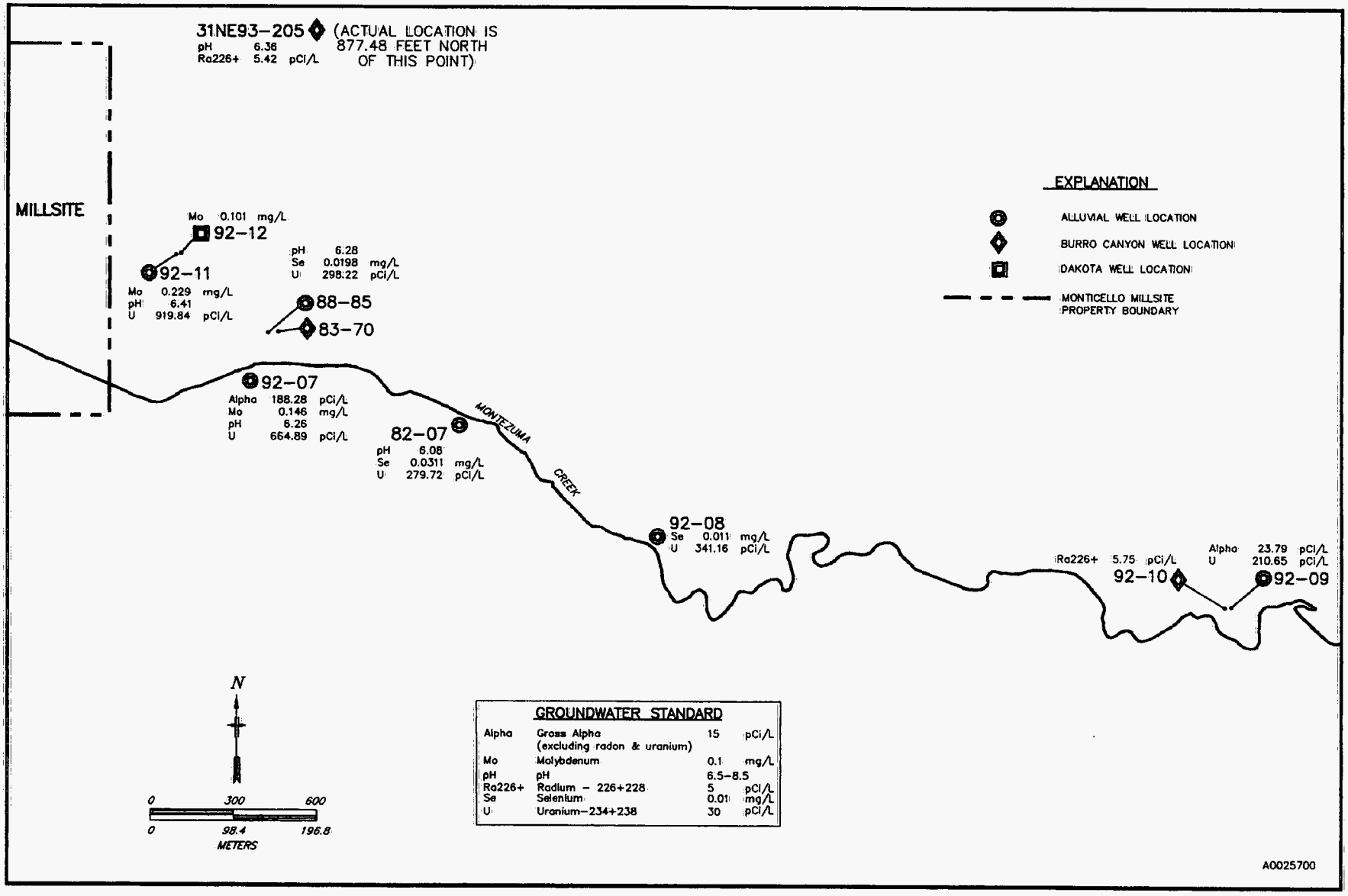

Figure C-4. Concentrations of Groundwater Analytes that Exceeded Federal/State Standards in Well Samples Downgradient and Crossgradient of Monticello Millsite in October 1994